1884. 1885.

CATALOGUE

AND

PRICE LIST

OF THE

AMERICAN WELL WORKS,

AURORA, ILLINOIS.

AURORA IS LOCATED 38 MILES WEST OF CHICAGO

On the Main Line of the

Chicago, Burlington & Quincy

RAILWAY.

And a Branch of the

Chicago & North-Western

RAILWAY.

CONTENTS.

NOTICE TO THE TRADE.

We take pleasure in presenting to our friends and the public our new Illustrated and Descriptive Catalogue and Price List of the various descriptions of goods manufactured and sold by us. With an experience of twenty-four years in our business, we are, with our judicious engineering and mechanical skill, enabled to furnish a very superior class of goods. A few years ago we could have imagined we had, with our facilities and valuable patents, reached the top round of "Jacob's Ladder," when our inventor, Mr. M. T. Chapman, discovered the process of pumping a hole into the earth, which is done by mechanical means, which enables the lower part of the well to be made faster than the upper part. But we have since added another round to the lofty ladder, viz: two tools that make a larger hole at the bottom than the one they passed through at the top, to let the casing of the well down easy. *This is an accomplished fact,* and is more than could have been expected from the inventive genius of man.

Since the publication of our last Catalogue, we have added many and important improvements, have invented new tools and improved those already in use. Among the former we call attention to "Chapman's Patent Well Tester and Cleaner;" we have also added to our business the manufacture of Engines and Boilers suitable for well sinking.

To Parties Wanting Well Tools.

As a guarantee of good faith on our part, we will come and make a well, and show you that the tools do all we claim for them before we receive payment, as per our printed terms concerning the sale of Well Tools.

Telegraph Cipher.

In this fast age *time is money,* and we have adopted a system of telegraph cipher which will enable any of our friends wishing goods on short notice to order by telegraph, at slight expense, as nearly every article in our catalogue has a name (in brackets) to designate it. All orders will receive prompt attention.

Terms Cash.

No allowance will be made for exchange or express charges on remittances. Eight per cent. interest, from date of shipment, will be charged on all bills running over thirty days. All claims for deduction or damage must be made within ten days after receipt of goods. Our goods are all shipped in good order. We do not insure safe carriage or delivery. In case of damage your recourse is upon the transportation company.

All bills due on first of the month after shipment of goods.

A discount will be given to the trade. Our prices are subject to market change without notice, and this catalogue takes the place of all previous lists. In ordering by letter, please refer to the figure in catalogue and name in brackets.

We ship no goods whatever to strangers without an advance to cover transportation. Iron pipe and heavy goods shipped from Chicago.

Respectfully Yours,

AMERICAN WELL WORKS.

T. G. CHAPMAN, Compiler.

NOTICE.

M. T. and M. C. Chapman are the inventors of the wells using an iron tube having an open end, and covered by a patent of September 24th, 1872, and having others patented March 4th, 1873. They did, in fact, cover by patents the use of the tube when the same forms the wall of the well, and the working barrel of the pump having an open end above and below, so that the working parts could be removed and repaired.

Their Patent Hydraulic and Jetting Processes of making wells are now perfect, and there seems to be nothing that could be suggested that would improve the well or the manner of making it.

We positively assert that a well cannot be driven straight, and that a hole cannot be bored straight, through the average soil.

OUR PROPOSITION.

To any parties wanting wells: We will make them regardless of the surface to be penetrated, whether it be of sand, clay, rock or quicksand, or the whole combined, and guarantee a first-class well. But as this will likely come to the hands of parties who have experienced difficulties with experimenting men and imperfect tools, we will give you One Hundred Dollars ($100) if we cannot make a well at any place you wish, (even where an *Artesian, Drilled, Dug, Drove, Emigrant or Auger Holes*, have failed) it being our fault or the fault of our tools.

OUR $1,000 CHALLENGE TO THE WORLD.

We will deposit $1,000 against any Drive Well or Auger Company's equal amount, to make a well any place, through rock, clay and quicksand. The parties making the best well in the quickest time shall get the money and half the price of the well—the party getting the well shall receive the other half price of the well.

It is our intention to collect royalties for infringements on the Chapman patents.

We are making a specialty of Well Sinking Machinery, and if you will engage in the business, we will furnish a man from the house to make the first well in your territory, to show you how to manipulate the machinery and teach you the science of well sinking. This is a profitable business, and with our machinery the work is comparatively easy. Confidential cost of materials and profit of the business will be furnished you on application, if we have no one engaged in the business in your neighborhood.

Soliciting your favors, we are,

Your obedient servants,

AMERICAN WELL WORKS.

General Inquiries Answered.

Question 1.—I see in your advertisement, you guarantee to make a well and furnish water where either an *Artesian*, a *bored*, a *dug*, a *driven* or a *drilled* well has failed to do so. How can you do this where the *Artesian* has failed, and wherein is your process superior ?

Answer 1.—By the *Artesian* process the well is drilled until the drill is prevented from dropping by the chips which fill the seam in the rock and quickly cement the crevices tight, thus preventing the water from coming in through the seams in the rock. Rock pulverized under water sets as readily as water lime, and if, when the tools are broken and left in the hole, they are not quickly removed, they must be drilled loose before they can be taken out or the hole lowered.

The expense of setting up an Artesian set of tools is about equal to the labor and first cost of making the *Chapman Hydraulic* Jetted Well of from three to five hundred feet, and as a matter of profit it pays those making Artesian wells to shut off a vein of water within five hundred feet of the surface, because they get pay for the hole that is made, whereas we get pay for water at the depth found.

Our wells are always clean, for by the Hydraulic process we take the chips out with the water, and clean the well as it is being made. Hence we get water where the Artesian cannot.

Ques. 2.—Have you ever made wells in places where the Artesian has failed ?

Ans. 2.—Yes ; in Aurora, Ill. ; Paxton, Ill. ; Sioux City, Iowa, and other places.

Ques. 3.—Does the water ever flow over the tops of your wells ?

Ans. 3.—Yes, in a large proportion of them it does, and we supply Chapman's Deep Well Pump, free of extra charge, in cases where it does not.

Ques. 4.—How can these deep wells be pumped ?

Ans. 4.—By hand, horse, wind or steam power. (Our pumps work comparatively easy.)

Ques. 5.—What kind of a wind mill do you recommend to work with your wells ?

Ans. 5.—The *American Advance*, because it has a very long stroke, a wrought iron mast, a solid wheel, a very sensitive governor, is noiseless while running, very durable, simple and strong. It costs a little more than the ordinary mill, but is much cheaper in the end. It does not freeze up with sleet or ice.

Qves. 6.—How can you make a well where an emigrant well has failed, and guarantee water or ask no pay ?

Ans. 6.—That is easily done. In this case the well auger men cannot go through the hard pan ; they have to stop in the quick sand. The wells fill from the bottom ; sometimes they cave in and dry up ; rats, cats, rabbits, sewerage, or the alkalies get in and spoil the water. We put our pipe down in these wells through the hard pan and get a supply of water that cannot be exhausted, then fill up the old well. (See cuts of deep well valves and pumps.)

Ques. 7.—How do you make a well where a dug well has failed ?

Ans. 7.—(See Ans. 6.) Put in a Chapman Deep Well Pump.

Ques. 8.—How can you make a well where the drive well screen chokes up or the well goes dry ?

Ans. 8.—We pump out a reservoir by our hydaulic process (see Fig. 116), or go down below through the hard pan and put in our Chapman Deep Well Pump. (See cut in this catalogue.)

Ques. 9.—How do you make a well in a drilled hole and get water?

Ans. 9.—We drill down below if we think it is too shallow; and if we think it advisable we put in a torpedo.

ALKALI REGIONS.

Ques. 10.—You say you can get good water in the *alkali regions.* Please explain.

Ans. 10.—Yes. The alkali and foul substances in the soil are all above the hard pan, and by putting a tight iron or galvanized pipe (not sheet iron, but oil well pipe) tight down, the foul substances cannot get into the water strata, and you have as good water as ever flowed from any spring. It is an artificial spring in fact.

[The health and happiness of the human race depend so much upon a proper supply of pure water, that you would only be doing your duty and what you owe mankind, by advertising and using every avenue of communication to instruct your fellows in the art of getting water by your patent hydraulic process, which I believe excels all inventions hitherto made for getting a good supply of pure water. I see the authorities of New York City have used their power to prevent the people from drinking water from a dug, bored or driven well, as so many diseases have been traced to the use of impure water from these cesspools, called wells, and a law has been passed to prevent any more of such being made.]

Ques. 11. What is the cost of your wells?

Ans. 11.—Our well costs $1.50 a foot for a 2-inch well, not exceeding 100 feet. This includes the well and pump complete. This is the size used in the Pennsylvania oil regions, where hundreds of barrels are pumped daily. This is large enough for domestic use, for a stock farm, or to supply water for a forty-horse power steam engine. For a deeper or a larger well, see prices in this catalogue.

Ques. 12.—What amount of water can be relied on with one of your two inch wells, using your best pump?

Ans. 12.—From twenty-five to one hundred barrels per day. (See Wm. Malchow's testimonial, page 6)

Ques. 13.—Can your pumps be repaired without going down into the well, and with ordinary tools?

Ans. 13.—Yes, by loosening the pump cap and drawing up the wood sucker rods, and putting on two new leather cups and replacing the rods. (The wood rods are screwed together in 16 feet lengths by the use of two wrenches.)

Ques. 14.—Can I fix my own wells? I have a dug well 86 feet bricked up. I have sand pumped it till the well is liable to cave in. You see as the water goes down I sand pump it and get a little more. I also have a bored or emigrant well 92 feet, curbed with wood tubing, which has got crooked so that I cannot get a bucket down to pump the sand out. When Mr. ——— bored my well it caved in on one side, and the tube has bent over to the caved side. There is plenty of water in both wells, if I could keep the sand out. What I want to know is, can I buy the materials of you and fix my own wells? If so, what tools shall I want, and what will they cost?

Ans. 14.—You can make your wells yourself. You will need two pair of adjustable tongs, that will fit from ⅜ to 2½-inch pipe (Fig. 80), $14.00; 88 feet 2-inch well pipe, $40.48; set Chapman's combination screen, cylinder and valves, complete, with drive point (to drive down), $12.50; one Fig. 51 wrought iron 3-stroke pump, $9.00; six 16-foot wood rods and couplings, fitted, @ 60c, $3.60—total, $79.58. Now screw the pipe together, and put it down as far in the sand as you can; put in the valves, by screwing the rod into the plunger, and screw on rods till the sucker is down into the smooth working barrel; connect the pump, and you have the whole complete. You can order a few extra short pieces of pipe, and drive the pipe with a sledge by getting a drive cap and holding a piece of wood on the top. (See illustration of wells.)

Ques. 15.—How long will it take to put down a well 100 feet in clay, sand or chalk rock?

Ans. 15.—In river bottom sand or sea mud, one day; in blue clay or soil, one day; in chalk rock, from one to two days; in sand rock, from three to six days; in lime rock, from five to ten days. We do not mean to say that this is the exact time, but is a fair average.

Ques. 16.—Are your tools durable, and are they capable of making a well without a man spending half of his time running to a blacksmith shop? If I get tools I want a durable set and one that I can rely on.

Ans. 16.—These well tools are the result of a life of practical experience in the business, and the inventors watching closely all improvements made, and having men working in so many parts of the Union and Canada, being also manufacturers, they have brought their goods to such a degree of perfection and worked up such a reputation, that they can now boast of the largest manufactory of its kind in the United States. Since we guarantee our tools, and will come and make a well for you before or after they are paid for, you run no risk in ordering.

Ques. 17.—How long have these wells been in use? Can you give me some references?

Ans. 17.—About fifteen years. (See references.)

Ques. 18.—Have you had the well patented?

Ans. 18.—The well was patented September 24th, 1872. We have had several patents since, and applications pending for many of our improved devices and machinery. Our wells were formerly made by hand. Experience has suggested so many improvements that it seems now that all parts thoroughly harmonize into a simple and perfect set of tools, and we cannot now see the want of a single improvement.

Ques. 19.—You have tools then that will drive, bore, drill, hydraulic, or jet, a well anywhere, containing tools suitable to any soil? Will you sell small or large outfits for different depths, or part of a set?

Ans. 19.—Yes; we will sell any tools we make, but when a part of a set is ordered, cash must in all cases accompany the order. We cannot send a man unless a full set is ordered.

Ques. 20.—Can I buy a set of tools, make my own well, and then sell my tools to my neighbor, who is in the same fix as I am?

Ans. 20.—Yes; that is what Jenks & Son, of Yankton, D. T., did. They bought a No. 2 set to make a well 500 feet deep. They made a 2-inch well on their garden farm 460 feet deep and got a good flowing one, and then they sold their tools for just what they cost them. Many parties do this.

Ques. 21.—Will you tell me how you first made the Chapman well, how you discovered this rapid process, and the difference between the jetting and hydraulic process?

Ans. 21.—From 1868 to 1872, we drove an auger into the ground with a wooden beetle, then drove in the casing and put in screens as seen in Fig. 39. Next we bored and had a hand windlass to raise the auger, and drove the casing with a block of wood by aid of the windlass. (See Fig. 39.) Then we bored by hand, and used a horse-power to raise the auger and drive the casing. We raised and dropped the drill by means of a rope wound around a continuous running drum, a man tightening and loosening the rope to get the raise and drop. It took about an hour to put down and take up the auger two hundred feet, but only a miuute to fill it.

Then the hydraulic process suggested itself to us, and by this we can penetrate stone, clay, sand, gravel and rock, and make a well without taking out the tools for change as we reach the different stratas (at Akron, Colo., we made in Jan., 1884, 196 feet without lifting the tools from the hole) and on coming to water, we clean the vein of dirt and fine sand, leaving a *beautiful bed of gravel to filter the water through.* This was so *perfect* that we made a self-dropping hydraulic machine, which, together with the horse-power, drills and pumps, *brings all the drill cuttings out of the well.* At ease, with folded arms, the operator can witness the beautiful workings of this labor saving machine.

The jetting process is similar to the hydraulic. The water is pumped down the hollow drill rod with great force, and passes out of the bottom of our "Paddy," making a large hole very quickly. The casing falls down by its own weight, and the cuttings come up the well with the current of water. (See cuts in this catalogue.)

Ques. 22.—How can an Irishman (Paddy) get down so small a hole in such a deep well?

Ans. 22.—We do not mean that a man is down there—it is the name of a new tool that does its work perfectly and exactly like a laborer digging with a pickaxe. With a blow he sends the pick into the ground, and then wrenches it loose. So every time this tool is dropped it sinks into the ground and pries it loose, making a large hole to let the casing down easy. This tool can be used with the jetting or hydraulic process. It is so simple and perfect that the exclamation is: Why did not some one think of it before?

Ques. 23.—If you will give me an insight into the profits of the business, and come and make a well at my place, and make it as satisfactory as you describe in your catalogue, then I will pay for the well and tools.

Ans. 23.—You will find our special confidential prices, the cost of material, etc., and terms pasted in this catalogue; if not, send for them.

Ques. 24.—I have been using much larger wells than you recommend, and not getting water; it does not seem reasonable to me that you can furnish such a large supply in so small a well.

Ans. 24.—If you will examine Fig. 116, page 11, of this catalogue, you will see that a 2-inch well has an oil well pipe with a 2-inch hole leading from the top of the ground to the reservoir. This reservoir was sand, dirt, gravel and stone, but we removed all the fine substances and washed the gravel by the splashing of the water with the movement of the drill, leaving a clear open space.

WEST POINT, NEB., Feb. 27, 1884.

I made a 2-inch Chapman well for A. Leyse Weisner, Neb. It is 210 5-12 feet deep. We had a vent hole about $\frac{1}{4}$ inch open at the time I made the test, and pumped eight barrels per hour from it. The gentleman I made the well for will vouch for the truth of this. If the vent hole were closed it would supply fully one-fourth more, which would be over two hundred barrels in twenty-four hours.

WM. MALCHOW.

Write your POST-OFFICE, COUNTY and STATE PLAINLY.

PADDY EXPANSION DRILL.

Ques. 1.—What advantage has the Paddy or Expansion Drill over ordinary Drills?

Ans. 1.—First—It will drill a hole below the casing, large enough for the casing to follow down easily which cannot be done with any other form of Drill.

Second—It will drill much faster than other drills as the wings or bits pry the earth or rock loose and throw the debris up the hole in large pieces to be crushed by the vertical motion of the rods in its passage upwards with the current of water.

Third—Hundreds of feet can be drilled without removing the Tools from the hole—but I recommend that not more than 200 feet be drilled without removing them.

Fourth—No JARS or REAMER are needed. Its action is such that the force of the blow will expand the wings, hence when it is lifted they close. The sinker bar and jars are at least one-third the weight of the Tools, and since we dispense with these we save fully 50 per cent. in power. The common wedge drills wear on the corners and will then stick in the hole. Not so with the Paddy.

Fifth—By using the Expansion Drill we can force a stream of water through the Drill, and keep the Drill working on the clean cut surface, the dirt passing up the pipe. With the common drill the clippings remain and clog the bottom of the hole and the force of the blow is spent continually pounding on the already loosened clippings, until the Drill is taken out and the hole cleaned with the sand pump.

Ques. 2.—Is the cut of the Paddy an exact picture of it?

Ans. 2—No, sir. We make them of different styles to suit all materials and conditions.

Ques. 3.—Can you make me one for rope or pole Tools so I can drill a round hole?

Ans. 3.—Yes, sir. Send us the Drill Rod box or a template of the exact tread, and we will give you the most perfect tool you ever used and guarantee you can drill a large hole below your casing, but you will have to draw out and sand pump the same as you do now. Fix your sand pump so that it cannot catch under the casing.

Ques. 4.—How deep can you sink a well with your Expansion Drill and self cleaning apparatus?

Ans. 4.—We are sinking three now and everything works nicely, and as the tools are new we can only say what we know from experience.

One well at Fort Sully, D. T., for the U. S. Government, now down 509 feet.

One at Akron, Col., for the B. & M. R. R., now down 651 feet.

One at Vicksburg, Miss, for the D. W. Floweree Ice Co., now down 1,000 feet.

Ques. 5.—How deep did you ever put in one line of pipe or casing in a caving material?

Ans. 5.—We put in 637 2-12 feet of 5-inch pipe, where the well had been sunk 165 feet by others, at which depth they were stuck in river sand. This bed is 100 feet thick. After passing through it there is 16 feet of sand rock, then 456 feet of indurated clay mixed with shells. The only way to get through the caving material was to use the driver and drill at the same time, otherwise a few blows of the driver would have caused the casing to pack the bottom and have prevented it from going down.

Ques. 6.—How far can you drill with this Tool without removing it from the hole?

Ans. 6.—At a depth of 410 feet we drilled 230 feet, making 640, cutting a 9-inch hole and sinking a 5-inch pipe.

Ques. 7.—I understand then that you drilled 230 feet and sunk the casing and kept the drill clippings out of the hole.

Ans. 7.—Yes, sir. We guarantee with these tools to clean out the drilling, without removing the tools as must be done with other tools.

Ques. 8.—I have experienced trouble in keeping a round hole. Will your Paddy Expansion Drill do it?

Ans. 8.—Yes. The Paddy strikes first, when closed and small, and the weight of the Rods and the momentum of the blow forces the wings asunder and do not allow the point to turn the drill aside, and the tools work so perfect that I have never experienced the slightest difficulty. You must not loose sight of the fact that the water jet coming directly to the cutting edge, carries the dirt up and helps to cut the hole. With this combination there seems not the slightest chance for an improvement. The exclamation with well men is, "If I had had these tools years ago, I should have been a rich man before this."

CHAPMAN'S HYDRAULIC WELL MACHINERY AT WORK.

Drilling and Pumping a Hole into the Ground, and bringing the Chips, Drillings, Dirt or Sand out of the Hole to the Surface without removing the Tools.

Fig. 109.

Chapman's Hydraulic Well is so made with automatic machinery that it carries the bottom of the hole to flow to the surface, although it may be clay, sand, gravel, limestone, slate and ordinary strata of rock, but porphyry and sylenumitic rock, which cannot be cut with steel drills, we cut with diamonds. (See further Illustrations for the general construction of operations.)

This cut illustrates the machine at work pumping a hole down. A horse applies the power to what we name our drilling jack. This jack mechanically raises the hollow drill rods, and drops them successively; the dust at the well turns the drill as it drops. A barrel is filled with water and provided with a hose, which conveys the water into the hole that is being made. On the lower end of the rods is a steel drill having a valve so arranged that, when it drops, the sediment passes into the drill rods; the valves closes as the rods are being lifted, and the rods drop again.

Now, scientifically it has been demonstrated that a heavy body falls faster than a light one—so this iron pipe, being heavier than the water and mud inside, drops first, before the water goes ready; second, drops faster while in motion, and striking with a heavy live a rubber ball, and cutting the bottom of the hole, sends the water and mud up the pipe, and that being provided with check valves opening upwards, throws the water up through them, and the valves prevent its return, causing it to flow at the surface.

The drilling jack has a self-feeding attachment that lowers the tools as the hole is deepened. Now it will be seen that the tools do not have to be drawn to take out the dirt, as changed as different strata are reached. The top of the derrick is provided with a pulley, to hold the rod in place when withdrawn.

We have invented two new tools for making the hole larger than the tubing, so that it can easily drop therein. One we call a "Paddy," (Fig. 97 P), and the other a "Monkey," (Fig. 97 M). Every time they drop they spread out and cut the ground loose, and when they are raised they close in position ready to be dropped or drawn out of the tubing. They can make a hole six inches in diameter and pass through a 4-inch tubing.

Full instructions for making a well by this process accompany each full set of tools.

Hydraulic Jetting Well Machinery.

Chapman's Lightning Well Sinking Machinery, or the Hydraulic Jetting Process and Machinery, so far excel all others that they cannot be contrasted with any, and being protected by patents and applications for patents pending, there cannot legally be anything of the kind made by any other manufacturer, and should we find such we will give either the dealer, maker or user, the benefit of bitter experience.

With this combination the Expansion Drills are used, which make a hole large enough for the casing to fall easily, and do not need to be removed for repairs as they are so made to pry the rock or dirt loose, working in harmony with a current of water forced around the drill under hydraulic pressure. They will practically drill one hundred feet without the necessity of removing.

The Combination Jetting Rig is set up the same as the hydraulic set, Fig. 109. A horse power is shown in the cut, but a steam engine is better adapted for large or deep wells. In this process a pump is used and connected to the Drilling Machine, for Horse Power Machines. Our Steam Engine Rig is more complete. A hose from a force pump is connected to the hollow hydraulic drill rods by a suitable swivel. On the lower end of the rods which screw together in sections is the Paddy Expansion Drill, with holes so arranged that the water passes from the force pump, through the hose, down the rods and out through the holes in the Drill, the force of the water at the same time helps to cut the hole. The water then comes directly in contact with the newly cut debris, carries it up quickly in large cuttings, but the vibration of the rods crushes it more or less in its passage out so that by the time it has reached the top in a 500 foot well it is in the form of mud flowing freely with the water. (Two tanks may be used, one at a time, to catch the mud and save the water, as the mud settles, to be used again.) After a sufficient depth has been drilled proceed to put in the casing as follows: Disconnect swivel from Drill Rods, place a length of Drill Rods inside a length of casing, put Drive Block on upper end of Drill Rods and connect Swivel, raise all together, then connect Drill Rods, then proceed to lower the casing first, or lower casing, and drill at the same time. In case of quicksand and gravel they must both be driven together, as fast as you drill a hole the casing must follow into it. In this manner you can sink a hole to a great depth very fast. Do not sink more than 200 feet without removing the tools to examine.

Our hurry to get to press with this Catalogue has prevented us from illustrating the Jetting Machine set up. Page 12 shows a ground section of the Tools at work. The Drilling Machine is the same as the Hydraulic, with force pump connected to the shaft of the Balance attachment by means of a pitman. The Derrick is made of 8 pieces 2x6 scantling 18 feet long, bolted together in pairs with a 4 foot lap so as to make four legs.

GOING THROUGH QUICKSAND.

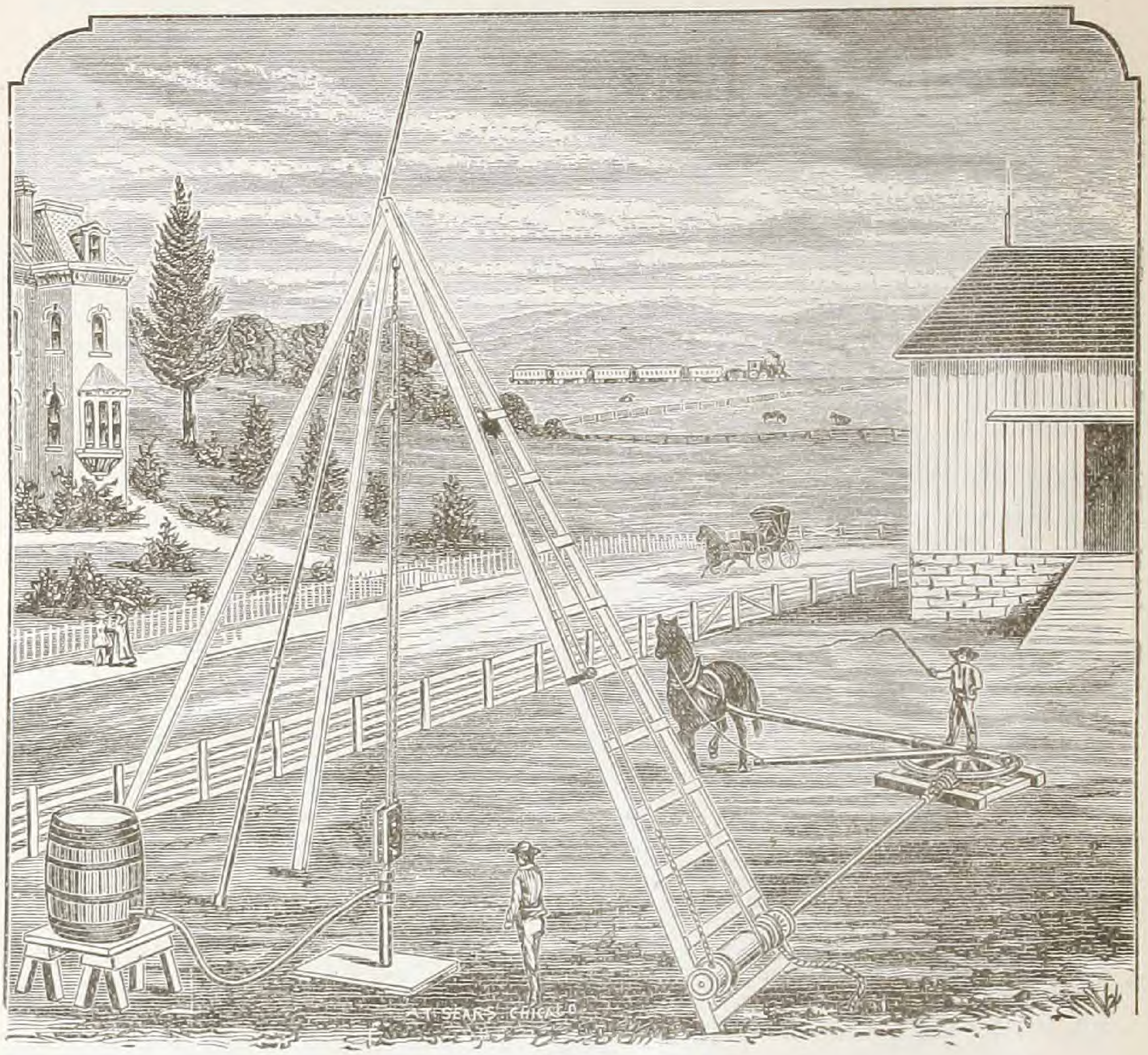


Fig. 111.

In this cut we represent our machine at work when passing through deep beds of quicksand, sea mud, and such deposits found along river bottoms, and is the same as illustrated in Figure 109. The hollow block is used to settle the casing at the same time the hole is being deepened.

The operation of making the hole is the same as illustrated in Fig. 109. The driving block is guided to place by the drilling rods, and is dropped occasionally, as may be required, without stopping the pumping process.

It will be observed by this arrangement that we have mastered the art and overcome the difficulties that are encountered where quicksand and similar deposits are found. This device will be appreciated by experts in well sinking.

We challenge well men to find any bed of quicksand that we cannot penetrate. Heretofore, by all methods that have been used, quicksand has baffled the skill of the most successful, and enormous amounts of money have been spent to obtain wells in such localities. We can say conscientiously, that quicksand is "our fat," for instead of being the hardest, it is now, by this process, rendered the easiest to penetrate.

At the bottom of those beds hard pan, in thin stratas, is usually found, and by going through it, a flow of water is always reached. It is not necessary to go *through the sand* if of a coarse or gritty nature, as a screen can be set in those beds, which successfully filters the water. We will not here describe how this is accomplished, and it is held as a secret with us, and given only to parties who are justly entitled to it—having and using our well tools.

DIAMOND MACHINE AT WORK.

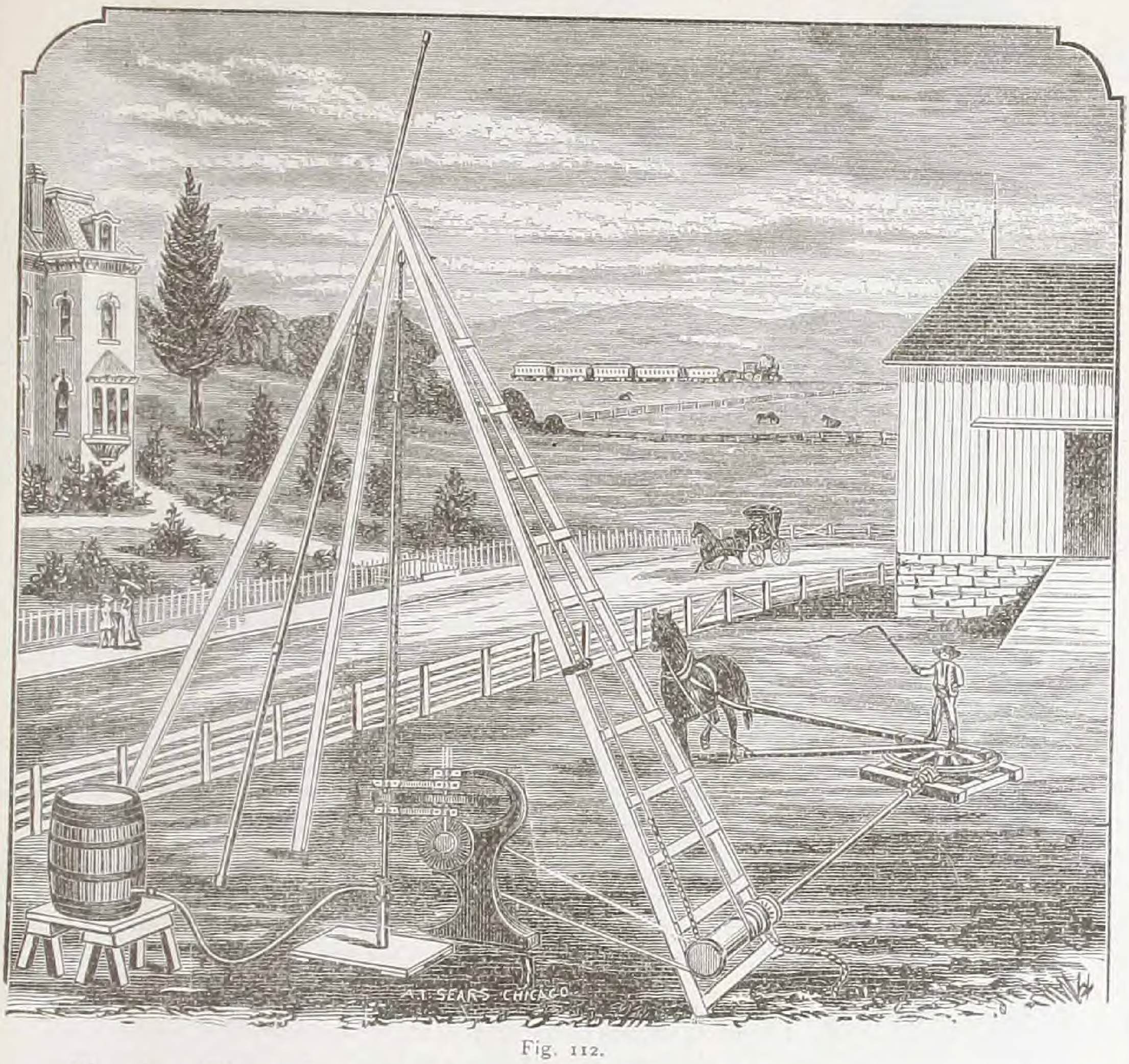


Fig. 112.

The above illustration represents our Diamond Boring Attachment, as applied to our Hydraulic Machinery. This machine is the same as previously illustrated, and in addition, is provided with belts and pulley, to rotate the diamond drill, and can be used for cutting the hardest rock. The operation of our diamond boring machine is as follows:

DIAMOND BORING BIT.

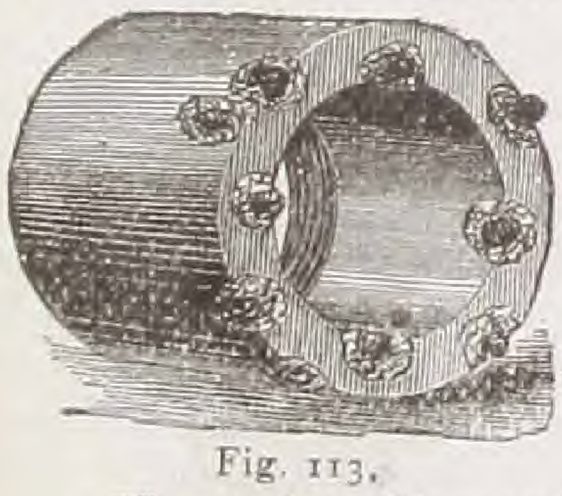


Fig. 113.

The diamond bit is screwed on a wrought iron pipe (see Fig. 113) and is inserted into the hole to be bored and rotated very rapidly. A stream of water is forced into the boring rods by our Hydraulic Jetting Machine, which carries the cuttings up the casing to the surface, leaving the core in the core lifter undisturbed as cut from its bed. After a sufficient distance has been bored, the rods are withdrawn and the core with them. The core shows exactly the strata of rock as they naturally are, and for mining and prospecting this is the only true method of obtaining accurate knowledge of what is gone through.

Heretofore diamond machines have been made only by a few parties, and their high prices have prevented their general use, but the price of our machine places it within the reach of the trade, and can be operated by ordinary labor. The old method of using diamonds was with a machine that cost from $3,500 to $10,000, and it required skilled labor to run them. With ours the price varies from $500 up.

It must be observed that these diamonds penetrate the hardest rock with rapidity without difficulty. They are imported from England, and are warranted to us to bore ten inches per minute, with steam power, in slate sand and lime rock. They are rotated at a high rate of speed, and give the best of success. References on application.

These diamond tools will be fitted for mining purposes of designs to suit.

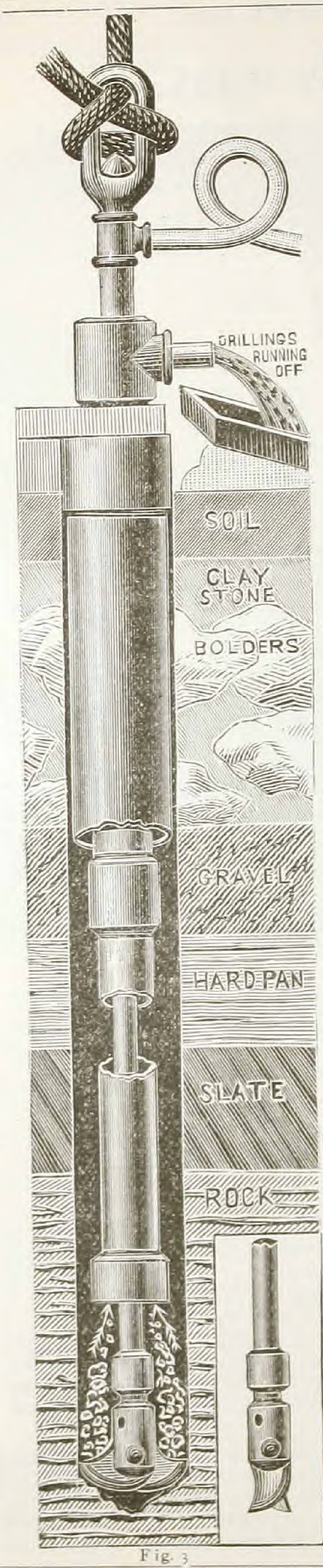


Fig. 3

Imaginary Ground Section,

SHOWING THE

HYDRAULIC JETTING TOOLS

WITH

PADDY EXPANSION DRILL

AT WORK.

On the annexed cut, the small figure shows the Paddy, closed as it passes through the casing. In the large cut the wings are shown open prying the dirt loose, and the course of the debris up the casing is shown by the direction of the indicating arrows. In making a well with the jetting tools either steam or horse power is used, according to the depth of the well to be sunk. The Derrick is made and set up similar to that for the hydraulic Tools. With these tools are provided pulley blocks, single, double or treble, according to depth. In drilling shallow wells the cam plate of the driller should be set to give the tools a drop of say 2½ feet for 100 foot wells, but in deep wells the length of drop can be lessened on account of the weight of the Tools. This is done by adding more blocks and thereby the strain on the power and Driller is equalized in deep and shallow wells and reduced to a minimum. Our Hydraulic Jetting Machine will drop from one inch to three feet. In sinking a well, pipe a size larger than the well to be made can be used. By this means the operator will be surer of reaching the desired depth, or one size pipe can be used to the bottom of the well. After the well is completed this larger pipe can be pulled out, unless a vein of salt, alkali or sulpher has been passed through. In which case leave the larger pipe in, and fill the intermediate space between the two pipes with hydraulic cement, so as to prevent the salt, &c., from destroying the iron, also to shut off connection with the surface. By this means the well will so last for all eternity. On the annexed cut the rope fastened to the swivel on top of the rods, passes through the pulley block on top of the Derrick and from there to the Drum.

The larger pipe is shown in the upper part of the ground section. A portion is cut out of the well casing to show the Hydraulic Rods, to the bottom of which is attached the PADDY Expansion Drill. The pump is worked by horse or steam power, the water forced through the hose down the hollow rods through the PADDY and comes in contact, under considerable pressure, with the newly cut surface, keeps the Paddy clean and, in working in harmony with the Drill, sinks the hole rapidly. The clippings after being pulverized by the vibration of the rods are forced up as shown by the arrows, and passes out as illustrated in the cut. By this process and the use of the Paddy, two very important points are gained. First, the hole is made large enough to allow the casing to follow, and second, there is no necessity to keep on continually removing the tools every few feet to clear the hole. Since using the Paddy well men write us "no more hard pipe driving," "hard pipe driving is a thing of the past." We have sunk 200 feet at a depth of 500 without removing the tools, but kept drilling right along, and when the tools were removed to examine it took 1½ hours to remove them. Now any practical man can see the enormous amount of time that is wasted by other processes, when 1½ hours are consumed every few feet removing tools. Full instructions how to operate sent with every set.

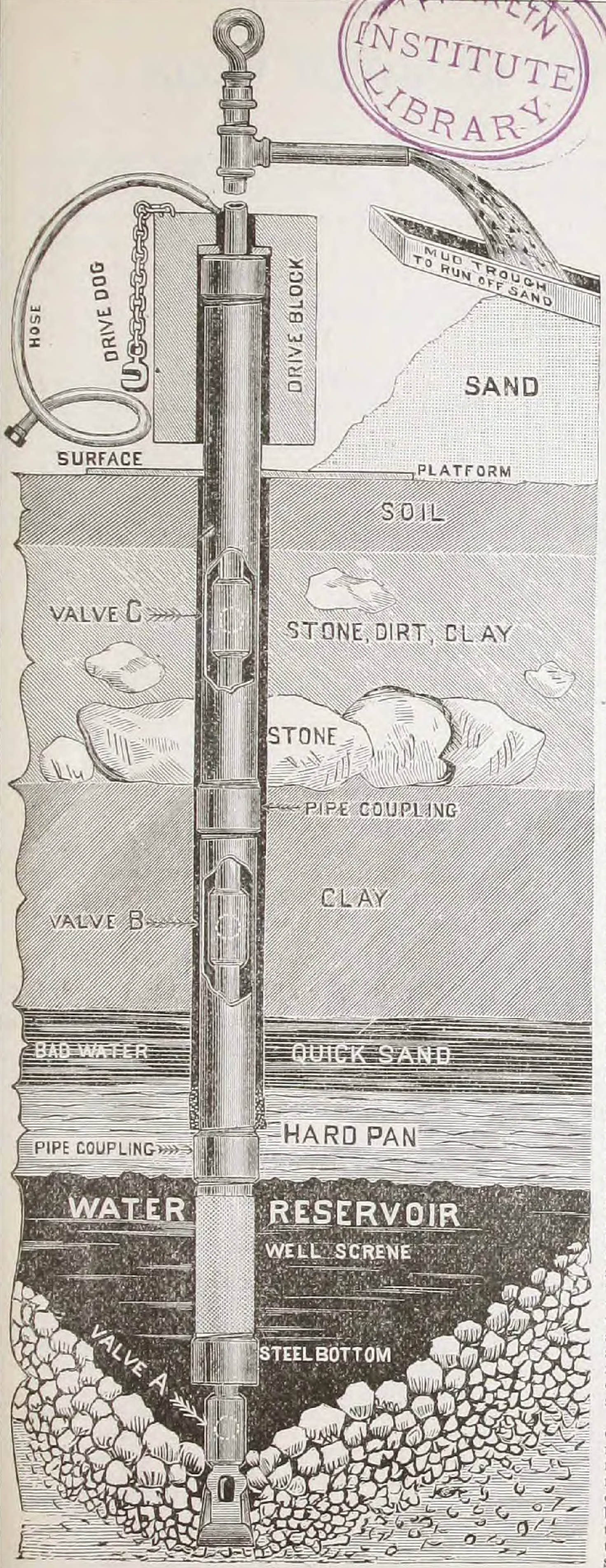


Fig. 116.

Imaginary Ground Section

OF THE

CHAPMAN

HYDRAULIC RESERVOIR

TUBE WELL.

Made by the Hydraulic Drilling Process, and is used extensively for

Farm, Stock, Manufacturing, City and Railroad Purposes.

This Hydraulic Process *pumps* the hole in the ground, after boring down a number of feet, which is cased with wrought iron pipe, and after reaching water below hard pan, pumps out the fine sand, leaving only the gravel, and thus forms the reservoir, as illustrated in Fig. 116.

The pumping is effected by pouring water into the hole, (this is done as illustrated in Fig, 109.) and forming a slush, which is raised to the surface by means of hollow drill rods with valves opening upwards at interval of, say. thirty feet, working inside of the casing which is to form the wall of well. (The casing can be driven at the same time the pumping or drilling is taking place.)

To the bottom of drill rods is attached a drill with a valve opening into them.

By the means of Chapman's Hydraulic Drilling Jack, connected to a horse power (see cut 109.) the rods are automatically raised and dropped suddenly. The drillings, or slush, being lighter, do not fall as fast as the drill rods, consequently, when the rods reach the bottom, as in Fig. 116, part of the drillings that were between valves A, B and C, have passed above the next higher valves and thus caused a partial vacuum between A and B, which, together with the falling force of rods, causes more slush to pass through A and fill the vacancy. The rods being raised again, the same operation is performed, and thus the slush will soon pass out of top as provided for in cut 116. This performs the work rapidly and efficiently, and obviates the necessity of removing drills from the hole till the well is finished.

When water is reached a reservoir may be pumped as before described, and as the hard pan, the last strata passed through before reaching water, is of a rocky and impervious nature, it remains in place, and thus prevents all salts. alkalies, sulphur, mineral, or organic substances from coming in contact with the vein, and thus destroying the good quality of the water, besides keeping the dirt from above from falling into and being carried up with the sand, when pumping the reservoir, and with the water when well is finished. It will be seen that this process insures an unfailing supply of water free from drainage, and leaves a clear bed of gravel which acts as a filter through which all the water must pass. And frequently these wells overflow, being in every respect equal to a spring in quality and quantity.

The great advantage these tools have over others lies in the fact that they do not need to be removed from the hole while making the well, consequently the ease and rapidity with which they work. The deeper they go the greater their weight and the better they work, (as the heavier they are the quicker they drop, and the quicker they drop as compared with the fall of the slush within, the faster they pump.)

THE CHAPMAN HYDRAULIC WELLS.

The Chapman Well consists of a heavy wrought iron tubing, having an aproximate smooth inside surface, screwing together in sections, making one continuous cylinder from the top to the bottom, and is sunk into the ground, as hereinafter described; the outside of the tubing forms the wall of the well, and the inside the working barrel of the pumps.

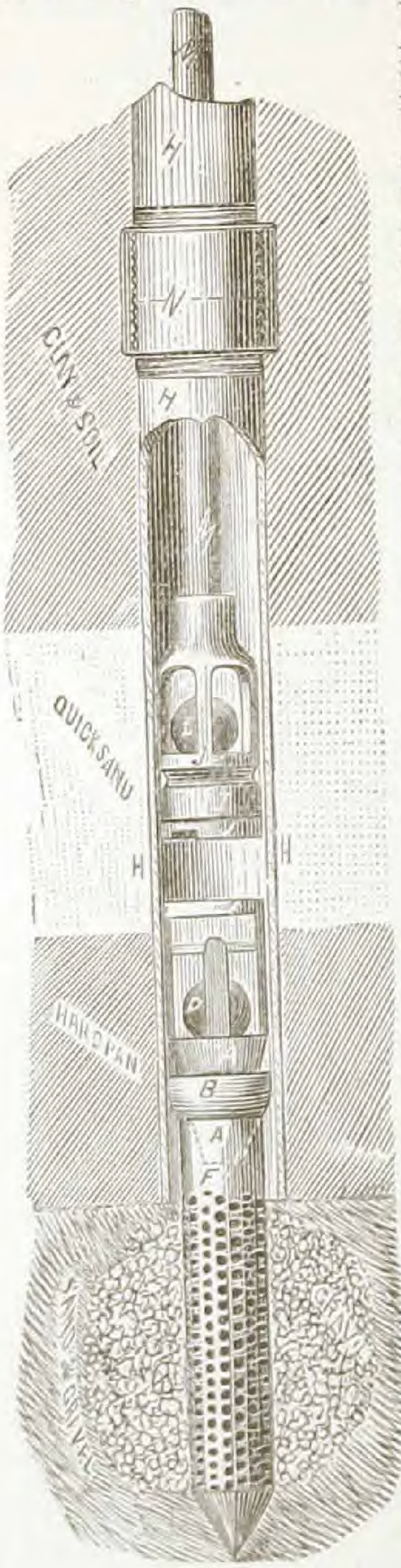


Fig. 39.

We use a polished steel working barrel, bored true and smooth, for the sucker to work in. It may be put on the bottom of the line of pipe to give greater strength, to prevent the tube from bending in passing through boulders and such like substances, or one may be used up the pipe between the sections. When water is reached, the screen, or filter, with a sufficient length of pipe attached thereto, is placed into the water strata, the upper end of the strainer tube extends up into the main tube, the check valve is dropped onto the upper end of the strainer tube, and forms a tight joint with the main tube and screen, thereby excluding all organic matter from the tubing; the plunger, or pump bucket, is now attached to the plunger rods (the lengths of which screw together) and put into the well, the pump-head is attached, and all is ready for work.

This is the only practical well to use in miasmatic districts, alkalious regions, blue clay and quicksand countries, and all places where a constant supply of good, pure water is wanted.

RAILROAD AND CITY WATER WORKS.

We are prepared to supply railroads, cities and towns with water in any locality, in amounts from 500 to 1,000 barrels and upwards daily, and at prices according to the amount of water desired. We solicit correspondence, and will take pleasure in answering inquiries and giving prices when desired.

PRICES AND WARRANTEE.

Price for a two-inch well, or opening, $1.50 per foot for first one hundred feet, in soil or earth. If rocky beds, we add $1.00 per foot to these prices, and warrant that the well cannot be pumped dry by twenty-four hours' steady pumping. For a two and one-half inch well, add 50 cents; for a three inch well, add $1.00; for three and one-half inch, add $1.50; for four inch, add $2.00; for 5 inch, add $2.50; and for 6 inch, add $3.00 per foot to price of two-inch well. Add $1.00 per foot for each additional one hundred feet. If galvanized pipe is used, 10 per cent. additional is added to the above prices. The depth of the well shall be measured from the top of the pump to the bottom of the hole. If quartz, ore or rock of an adamantine nature is struck, the price shall be on the basis of lime rock, at five feet per day, for the time consumed in drilling these hard substances.

No extra charge for the pump.

Board for men, the use of team, or fuel and water, if an engine is used, and free transportation of tools and men to and from job, free to American Well Works, while making said well.

If the water does not flow over the top of the ground of its own accord we will furnish free of extra charge one of the Chapman deep well pumps complete, and a wind mill at prices as shown in the wind mill department of this catalogue and erect the same free of extra charge for erectiug. The party getting the mill shall dig the post holes, draw all material, furnish anchor posts, assist in erecting the mill, board the men, pay the freight charges, and send in their order for the mill long enough before the completion of the well to give time to get the mill on the ground by the time the well is done, that there be no delay, if there be any such delay, the party getting the mill shall pay the man's time while waiting, and board him.

If the party getting the well made misrepresents his financial responsibility or anything pertaining to the well, orders the work stopped or sunk below a water bearing strata, or stops the work by a failure to carry out his or their part of the contract, or neglects to supply material, he shall pay for the well at the depth attained and wages for men, and board and expenses caused by such delay, and the American Well Works shall by any such act be freed from all responsibility herein named.

WARRANTY FOR THE CHAPMAN WELL.

We warrant the well, as before described, to be well made, of good material, and not liable to get out of order, and fully sufficient for all of the purposes for which it is constructed—and if it proves in any way defective, on receiving reasonable notice we agree to put it in good order, free of charge, unless it becomes necessary to be deepened in order to procure the amount of water desired, and its additional depth shall be paid for at the rates and terms as per catalogue. The veins or beds of water vary so much that we do not confine ourselves to any exact plan, but reserve the right to make them in any possible manner. This article is only detailed to parties buying tools.

TESTIMONIALS.

GLYNDON, MINN., May, 1881.

AMERICAN WELL WORKS, Aurora, Ill.—*Gentlemen:* We made one well 216 feet for Baines & McGill, for their steam elevator; 112 feet was clay and soil, 33 feet cobble stone and hard pan, clay and cemented gravel, 68 feet was quicksand, like putty, and it was so thin and stiff when we pumped it down that our tools could not get within 30 feet of the bottom of the pipe, and the sand rose near the surface, and when we struck the pipe a few blows with our drive block it would bound as if the end of the pipe was on solid rock. We went through that strata into three feet of nice gravel. It flowed at four feet below the surface 730 barrels a day, and it will rise 18 inches above the top of the ground. We also made a well 215 feet for Mr. Delworth, one of the Directors of the U. P. R. R., near Morehead, for his grain farm, and that furnishes water for his manager, Mr. Geo. Richardson, and for all the farm help, which is a small army, as he farms several thousand acres of wheat land. Both of these wells furnish good, wholesome water, used for steam and domestic purposes, and in each place Mr. ——, of Marengo, Ill., an expert, with —— augur, had bored several holes to about 112 feet, and could not make a well. Mr. —— went home, and *left his augur as a memorial tomb stone to the auger family.* These wells were made by Geo. Jewell, Glyndon, Minn.; M. T. Chapman, Aurora, Ill.; R. W. Rauney, Carman, Minn.

We refer you to all parties named herein. The tools used were purchased after they were tried, by Messrs. Jewell, Rauney & Co., who have since bought three other sets. Mr. ——, of Marengo, Ill., has since got a set of our tools.

Have Made Many Different Wells, but find yours Superior to any kind.

AUBURN, IND., February 22, 1883.

AMERICAN WELL WORKS, Aurora, Ill.—*Gents:* I have had ten years experience in the well business; have used all kinds of tools, have made different kinds of wells, including the Maoery, the Whipple, the Newell and Lucas, but find yours superior to anything that I have used, both wells and tools.

Yours respectfully, O. P. MEYERS.

Took out Three Kind of Valves, and Used Yours.

ANGOLA, IND., February 16, 1883.

AMERICAN WELL WORKS, Aurora, Ill.—*Dear Sirs:* I have used your valves for four years, and consider them the best for tubular wells. I took out the Morsey valve, and put yours in for W. W. Yuing, Hillsdale Co, Michigan. He will use no other in the two wells on his farm. I have taken out the Kalamazoo valves and used yours, and given good satisfaction, for James Anderson, Steuben Co., Indiana. He said that if he had fifty wells he would use no valves but yours. I took out a pair of valves for Mr. Morrow. a Hillsdale stockman. He could not use the well till I took out the Whipple valve and put yours in, and he said he never saw anything so perfect for a pump in his life.

Yours truly, S. MAXFIELD.

ASHLAND, NEB., January 20, 1883.

AMERICAN WELL WORKS, Aurora, Ill.—*Gentlemen:* In answer to your inquiry about your hydraulic well tools: They do more than you claim for them in your Catalogue. We started in a bored well 86 feet where an auger well borer failed. First we went through 26 feet of quicksand, then 85 feet of hard, red clay, 18 feet of sand rock, and got an inexhaustable supply of good water, which raised 140 feet. This was done in eleven cold, short days of January, 1883 We recommend them for any place where it is hard to get good water.

References. { C. A. HUYCK. N. G. WELLS. LEONARD TRUAX.

Yours truly, COL. E. L. CAMPBELL.

YANKTON, D. T. December 30, 1882.

AMERICAN WELL WORKS, Aurora, Ill.,—*Gentlemen:* You wish to know how we like the No. 2 set of Hydraulic Tools we purchased of you this fall. In answer will say that they have worked very well. We have put down a well 460 feet, using 2 inch pipe for casing. We never made any wells before. We set up the tools, and when the nature of the work required other tools, we looked in the boxes and found them, and we have discovered the use of every tool, and the set comprises all that is required for an Artesian, Hydraulic or Jetted Well. We used the three methods in this well. We did the drilling with one horse, and drew the tools with two. We want two other sets as soon as you can ship them.

H. J. JENCKS & SON,
Proprietors Jencks Hotel.

SIOUX CITY, IOWA, January 6, 1883.

AMERICAN WELL WORKS, Aurora, Ill.—This is to certify that we made a well for Mr. Skunkey, the tailor, 176 feet deep, and found plenty of water on the bluffs, and about one block from where Chicago parties put in an artesian well nearly 1,900 feet and failed.

CAMPBELL & CHAPMAN.

PAXTON, ILL, December 20, 1874.

To all whom it concern:—Be it known that we put in a well for B. F. Hill, for his grist mill, for steam and fire purposes, and got a good flow of water at the depth of 134 feet, and that the said Hill did furnish water to Chicago parties that were making an artesian well within forty rods, and on a level prairie, and at that time they had obtained a depth of about 1800 feet and claimed they had no water; that this said Hill supplied said parties with water for about $1 00 per day, but said parties claimed there was no water in the ground, and the work was abandoned without getting a satisfactory well.

CHAPMAN BRO'S.

N. B.—Since that time Hill has sold his mill and moved away, but several wells of our make have been sunk to furnish the town with water. Write to any parties in Paxton to corroborate the above facts.

AVON, FULTON CO., February 20, 1883.

AMERICAN WELL WORKS, Aurora, Ill.—*Gentlemen:* The tools I purchased of you last summer for sinking hydraulic wells, have given me not only ample satisfaction, but a pleasure—feeling that no difficulty or emergency can arise but that I can overcome it. The wells I have put down are not only a source of pleasant satisfaction and wonder, but also a source of pure, wholesome water obtained below all alluvial deposits, quicksand, &c., &c. Your standard pumps enable us to raise water from a great depth with comparative ease. The unanimous opinion is that your hydraulic well is the well for this country.

Truly, M. B. CHAMBERS.

Took out Three Kind of Valves, and Used Ours.

ANGOLA, IND., February 16, 1883.

AMERICAN WELL WORKS, Aurora, Ill.—*Dear Sirs:* I have used your valves for four years, and consider them the best for tubular wells. I took out the Morsey valve, and put yours in for W. W. Yuing, Hillsdale Co., Michigan. He will use no other in the two wells on his farm. I have taken out the Kalamazoo valves and used yours, and given good satisfaction, for James Anderson, Steuben Co., Indiana. He said that if he had fifty wells he would use no valve but yours. I took out a pair of valves for Mr. Morrow, a Hillsdale stockman. He could not use the well till I took out the Whipple valve and put yours in, and he said he never saw anything so perfect for a pump in his life.

Yours truly, S. MAXFIELD.

Made a Well in Five Days, 136 feet, where one Party Worked a Year, and Another Nineteen Days, and Failed.

MILLBROOK, ILL., January 15, 1883.

AMERICAN WELL WORKS, Aurora, Ill.—*Gentlemen:*—You wish to know how I like your hydraulic process for sinking wells. I made a well for Jas. Richmond, Big Grove, Kendall Co., Ill., in five days. The material penetrated was soil 2 feet, yellow clay 13 feet, blue clay 106 feet, with occasionally a "niggerhead"—one was over one foot through—then 15 feet of lime rock. Mr. Babcock worked one year and a half and made a hole 121 feet, and Mr. Samuel Sharks worked nineteen days and made a hole 90 feet, both failing to make a well. They used the spring pole process. I got a splendid flow within six feet from their hole. I will make wells and warrant water or ask no pay, in my territory. I think that the Chapman Hydraulic Process cannot be beaten.

Yours truly, GEORGE SMITH.

AURORA, ILL., May 8, 1873.

This is to certify that Chapman Bros., of Aurora, Ill., made a well on the Aurora Fair Grounds to the depth of 107 feet, and this well has supplied the Grounds during the Fair, where the two Artesian wells had been made about 446 feet and were a failure. In one the tools were in the bottom, stuck fast, cemented with the sediment; in the other we don't know the cause of failure.

CHAPMAN BROS.

N. B.—We refer you to O. N. Shedd, who will corroborate the foregoing fact.

FORT SULLY, D. T., Sept. 23, 1883.

This is to show that M. T. Chapman, Esq., of Aurora, Ill., came here and commenced work September 1, 1883, on an artesian well then at a depth of 295 feet, and on 22nd of same month he had drilled a 4-inch hole to the depth of 509 feet. The machinery used was Chapman "H" set of 500-foot Hydraulic tools. In my opinion the tools would have worked several hundred feet further. Work averaged about 8 hours per day. Material drilled was slate rock. I cheerfully recommend Chapman's process and tools for sinking Artesian wells.

R. W. HOYT,
1st Lieut. and R. Q. M., 11 Inf., Post Quartermaser.

Mining Review, Aug. 23, 1883: "Their process of sinking a hole is especially adapted for prospecting for minerals, coal etc., as the operator can determine the nature and thickness of each strata as it is penetrated."

What others say about us.

T. W. POWELL, Shabbona, Ill.—"Your well is the only successful one that has ever been sunk in these parts, either shallow or deep, and your tools do the work in one-third the time of the old way.

JOHNSON & COLEMAN, Steward, Ill.—"Your tools give satisfaction to ourselves and our customers."

M. WINTERSHIED, Mendota, Ill.—"Your Hydraulic well tools work to a charm; made 100-foot well complete in two days."

H. L. MCNETT, Greenville, Mich.—"Your hydraulic well of 80 feet will pump as easy as a drive well 30 feet, and I think it will last a lifetime."

ELIAS JEWELL, Wheaton, Ill.—"The pump you put in for me ten years ago gives perfect satisfaction."

JAY VANDERVOLGEN, Batavia, Ill.—"I have used your tools eight years and am satisfied. I think your well the best made."

G. W. LAUPER, Paxton, Ill.—"Have never failed in getting a good supply of water with your tools. I consider your wells superior to all others."

GEO JEWELL.—"I consider your tools for making wells the best I have ever seen for this country, as they will go through all kinds of wells."

F. F. MOSER, Shabbona, Ill.—"I think your tools superior to all others. There are a great many of your wells in this vicinity, all giving satisfaction."

R. W. RAGSDEY, Clyndon, Minn.—"I consider your tools the best I have ever seen."

G. S. HALE, Paxton, Ill.—"I have used different well machinery, but none that I like better than yours. Your check valves hold up water better than any I have used."

L. H. S. RARROWS, Woodstock, Ill.—"I think there is no other system of putting in deep wells equal to yours."

C. C. OYER, Berington, Ill.—"My well, 363 feet, was put in five years ago. It supplies lots of water in dry season for my 120 head of stock and my neighbors."

SAM. W. GOULD, M. D., Argos, Ind.—"The tube well supplies pure water, and is conducive to health."

A. L. CHENEY, Paxton, Ill.—"My well put down by you five years ago is working well."

JACOB CROMER, Wheatland, Ill.—"I am satisfied my No. 2 well would supply the town."

L. HAYWARD, Aurora, Ill.—"I have pumped 80 barrels a day from my 2 inch well, put in 13 years ago."

M. STEVENS, Algonia, Iowa.—"My No. 2 well Machine works splendid."

G. W. COOK, Hampshire, Ill.—"I have tried a great many methods and am sure yours is the only sure way in quick-sand."

BURNHAM THOMPSON, Lowell, Ind.—"Been using your tools six years. Can get water when others fail, through clay, dry or wet sand, rock and hard pan."

GEO. CRYLL, Elkhart, Ind.—"Your tools are a success anywhere. Your long stroke Mill is the "boss" for deep wells."

JOHN A. ROCHER, Argos, Ind.—"Before I bought your tools found many places where I could not make a well, but have since succeeded every time."

CAMPBELL & STITES, Monterey, Ind.—"After we bought your tools we completed five wells we had abandoned to 1879."

A. W. VANDERVOLGEN.—"I sunk a well 86 feet through cobble stones where 3 others had failed."

A FEW OF THE PARTIES

—USING OUR—

Tools, Wells and Mills.

IN ILLINOIS.

J. D. Sperry, Aurora, made in 1870.
Earl Sperry, Aurora, 1881.
J. H. Broomell, Creamery, Aurora, 1882.
W. L. Smith, Florist, Aurora, 1874.
D. Volentine, Aurora, 1871.
L. Hayward, Slaughterhouse, Aurora, 1871.
C. Solfisburg, Brick yard, Aurora, 1870.
Ben. George, Aurora, 1870.
Silas Reynolds, Aurora, 1870.
Dr. Gillett, Aurora, 1870.
Dr. Winslow, Aurora, 1872.
Chas. Weinaug, Aurora, 1872.
O. N. Shedd, Soap Works, Aurora, 1870.
Phil Jungles, Aurora, 1874
J. M. Stoddard, Aurora, 1880.
Ira Evans, Sycamore, 1870.
Kline Jackman, DeKalb, 1870*.
Ed. Baker, St. Charles, 1870.
Mark Bisby, Geneva, 1870*.
Morris Willey, DeKalb, 1870.
Jas. Outhouse, Blackberry, 1870.
Wm. Price, Grouse, 1870.
Mr. Burton, (Miller), Geneva, 1870.
Louis Gillett, Sugar Grove, 1870*.
Smith Waterman, Little Rock, 1870*.
Hiram Ellwood, DeKalb, 1870*.
Philo Young, DeKalb, 1870*.
John McCree, Creston, 1870*.
Lewis Bundridge, LaFox, 1878.
Thos. Belts, Naperville, 1878.
Chas. McNair, Blackberry, 1881*.
Wm. Moore, Blackberry, 1881.
Henry Sherman, Elgin, 1881.
B. J. Wetmore, Elgin, 1880*.
Chris. Webb, Hickery, 1880*.
Wm. Whitnell, Waukegan, 1881*.
W. H. Tibbeles, Steward, 1879*.
Jacob Miller, Paw Paw, 1879.*
Elias Jewell, Wheaton, 1873.
F. Fredenhagen, Downer's Grove, 1870.
Jacob Brown, Lewiston, 1874*.
Hiram Sibley, Sibley.
B. S. Eldridge, Galva, 1876.
H. L. S. Barrows, Woodstock, 1880*
L. I. Heath, Malvin, 1881.
Adam Butzer, Spring Hill, 1880.
A. A. Colvert, Spring Hill, 1880.
Jacob Butzer, Geneseo, 1878.
Geo. Peister, Geneseo, 1878.
Geo. Hill, Geneseo, 1878.
Joseph Ward, Geneseo, 1879.
Date Ford, Geneseo, 1879.

IN IOWA.

A. F. Davis, Union.
Baldwin & Hunt, New Providence, 230 feet.
S. P. Kinsley, Marshaltown, 226 ft.
Sand Sanderson, Union, 46 feet.
David Long, Union, 136 feet.
J. Q. Ervin, Whitten, 95 feet.
Philip Steinberger, Union, 50 feet.
W. D. Mills, Marshaltown, 218 feet.
E. D. Hunt, Longhill, 86 feet.
Louis Rash, Union, 100 feet.
D. B. Miller, Union, 70 feet.
Thos. Houser, Union, 180 feet.
Simon Hadley, New Providence, 95 feet.
Wm. Hartman, Whitten, 50 feet.
A. J. Miller, Whitten, 95 feet.
Peter Marker, Conrad, 46 feet.
Geo. Lockhart, Whitten, 130 feet.
J. Hawk, Liscombe, 112 feet.
S. B. Smith, Liscombe, 107 feet.
Pat. Lawler, Gifford, 110 feet.
Oliver Wildman, Lawnhill, 100 feet.
Joseph Howard, Bangor, 50 feet.
John Test, Union.
James Pickett Union.
Wm. Radwell, Union.
Henry Sheller, Eldora.
Miner Smith, Whitten.

The above wells were made by A. T. Davis, of Union, Harding Co., Iowa, in a little over a year. These parties have both our *Mills* and *Wells*.

Thos. Moore, Onowa.
The Wiley Farming Co, Onowa.
Chas. Hall, Sioux City.
Col. R. Moreton, Lamars.
Col. Strait, Lamars.
John Wallace & Co., Algona.

To Supply a Creamery.

M. Stephens & Cochrane, Algona.
J. N. Walker, Charles City.
Morris & Bro's, Dubuque.
Jos. Hilts, Boon.
W. S. Warren, Valisca.
Frank Hilts, Boon.
D. Hilts, Boon.

IN INDIANA.

Wm. Inwood, South Bend, 1875*.
J. Riddle, South Bend, 1876.
Z. Burnham, Lowell, 1876.
Wm. Ellery, South Bend, 1876.
P. E. Studebaker, South Bend, 1876*.
Hudson & Boyd, South Bend, 1876.
Elkhart Starch Co., South Bend, 1876*.
J. B. Regle, Goshen, 1876.
Jos. West, Bristol, 1876.
Mrs. Leedy, Goshen, 1876*.
J. Creag, Millford, 1876.
Hartsel Bro's, Argus, 1881.
Joseph Westerfield, Plymouth, 1880*.
Chas. Palmer, Plymouth, 1880.
Wm. Troumbly, Manutuckey, 1880.
Rob. Miller, Plymouth, 1880*.
Mr. Cass, Fort Wayne, 1880.
T. M. Thaxton, Plymouth, 1880.
Israel Muman, Legonier, 1880.
Dan. Shiverly, New Paris, 1878.
G. Sheldem, Algona, 1880.
G. H. Story, LaPorte, 1878.
E. Edington, Monterey, 1876.

IN NEBRASKA.

Geo. Squires, Grand Island.
Same. Mill at Aurora, Ill., 1870.
C. A. Huyck, Ashland.
Leonard Truax, Ashland.
N. G. Wells, Ashland.

IN DACOTAH.

North-Western Elevator Co., Fargo.
Phillsbury & Halbut Elevator Co., Fargo, 20 wells.
Grandon Elevator Co., Grandon.*
Wappleton Elevator Co., Wappleton.
Dalrymple Farm, Castleton, (several wells).
U. S. Government, Fort Sully.
Town of Plankington.*
Town of Mitchell.
Jenks & Son, Yankton.*
W. C. Morrison, Yankton.*
Town of Elk Point.
Capt. Wm. Duncan.

IN MINNESOTA.

Barnes & McGill, Elevator, Glyndon.*
Town of Glyndon.
Phillsburg & Hurlbut, Morehead.
R. K. Brown, Campbell.
Levi Hogison, Campbell.

CHAPMAN'S MAGIC EARTH AUGERS.

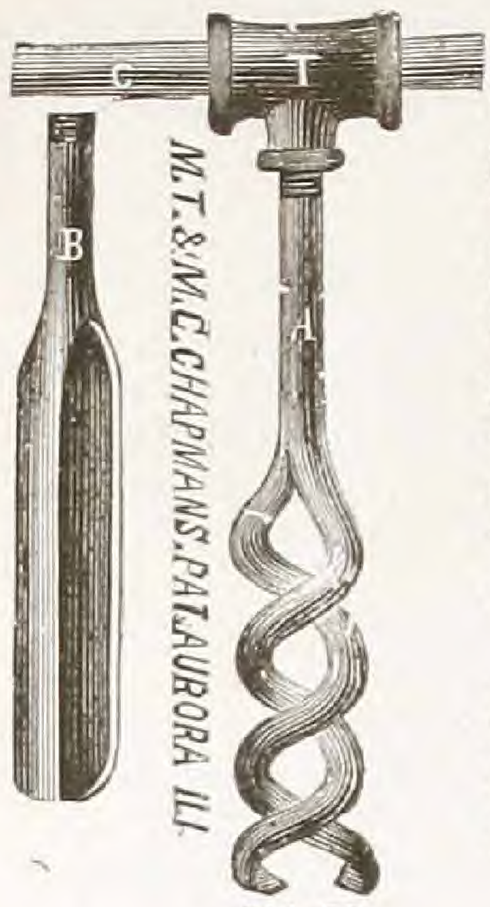


Fig. 25.

They are made of the best material, and together *will bore the fastest and easiest* of any augers in the world. Four-inch is the size generally used. They are indispensible to well men. A bores in soil, loose sand, gravel, clay and small stones; B is hard steel, and bores in blue clay, soft sandstone and soapstone. They are used to start the hole for the hydraulic or jetting tools; are also used by the drive well men, and will be found to be very useful to men having long augers, as they can go down with these when they cannot with the general earth augers.

Fig. 26

Sizes, inches	2	2½	3	4	5	6	7
Fig. 25, Spiral Auger	5.00	6.00	7.00	10.00	15.00	25.00	35.00
Fig. B, Pod Auger	5.00	6.00	7 00	10.00	15.00	25.00	35 00
Fig. 26, Ribbon Auger	5.00	6.00	7.00	10.00	15.00	25.00	35.00
Fig. 62, Twisted Auger	5.00	6.00	7.00	10.00	15.00	25.00	35.00
Fig. 63. Tw. Cased Aug.			12.00	15.00	20.00	30.00	40.00

Fig. 63.

HYDRAULIC AND JETTING WELL TOOLS.

Chapman's Patent Hydraulic and Jetting Pump Drills.

FIG. 27 T.

Cast cast steel. 2 inch, with clapper valve, (boat) $2 00
" " 3 " " " " (born) 4 00

FIG. 27 B.

Best f'g'd c'st st'l, 2 inch, for ball or bolt, (babble) $4 00
" " " 2½ " " " (bell) 5 00
" " " 3 " " " (base) 6 00
" " " 4 " " " (beach) 8 00
" " " 5 " " " (bib) 10 00
" " " 6 " " " (bird) 12 00

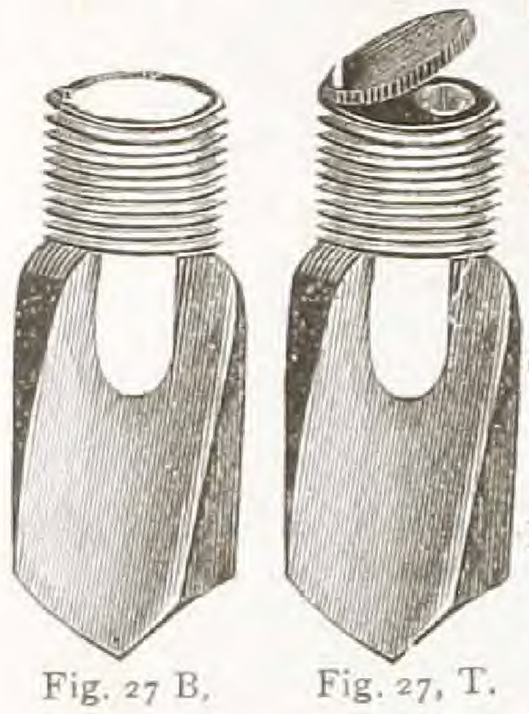


Fig. 27 B. Fig. 27, T.

Fig. 62.

FIG. 27 F.

Fig. 27 F.

Like Fig. 27, but flat. All made for ball or bolt valve.

Best forged cast steel, 2 inch, (blade) $4 00
" " " 2½ " (bolt) 5 00
" " " 3 " (bottle) 6 00
" " " 4 " (box) 8 00
" " " 5 " (brief) 10 00
" " " 6 " (bush) 12 00

The valve on top, as shown in the cut, is not included in the above prices.

AMERICAN ARTESIAN Z DRILLS.

Made of best English Steel.

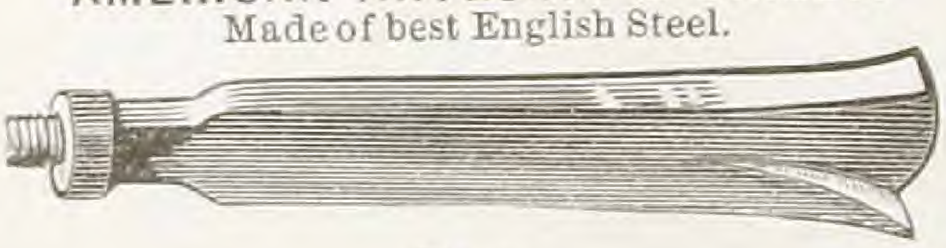


Fig. 74.

2 inch Z Drill, (broil) $14 00
2½ " " (brindle) 16 00
3 " " (buss) 20 00

For larger size Z Drill and Bar see Artesian tools.

FIG. 27 Z.

HYDRAULIC Z DRILL.

BEST FORGED CAST STEEL.

2 inch, for ball or iron valve, (brine) $4 00
2½ " " " " (bronze) 5 00
3 " " " " (brush) 7 00
4 " " " " (bumped) 10 00
5 " " " " (bung) 14 00
6 " " " " (buts) 18 00

COMMON WEDGE DRILLS.

Best English Steel.

Fig. 28.

1⅞ inch, (bay) $10 00
2⅜ " (bachelor) 12 00
2⅞ " (brick) 15 00
3⅜ " (boating) 18 00

DRILL RODS.

Fig. 74 R.

1⅛ inch, 16 feet long, (buggy) $15 00 | 1⅜ inch, 16 feet long, (Buffalo) $16 00

Extra Heavy Hydraulic Pipe Couplings.

Warranted not to split in drilling 1 inch, 50 cents; 1¼ inch, 75 cents.

EXPANSION DRILLS.

(PATENT APPLIED FOR.)

Something never known or used before that make a hole larger than the pipe they pass through. This has been claimed to be one of the *impossibilities*.

Hydraulic or Jetting Expansion Drills, forged of the best steel, to be used in clay, slate, soap stone, soft sand and lime stone, cemented fine gravel and sand, fire clay and hard pan.

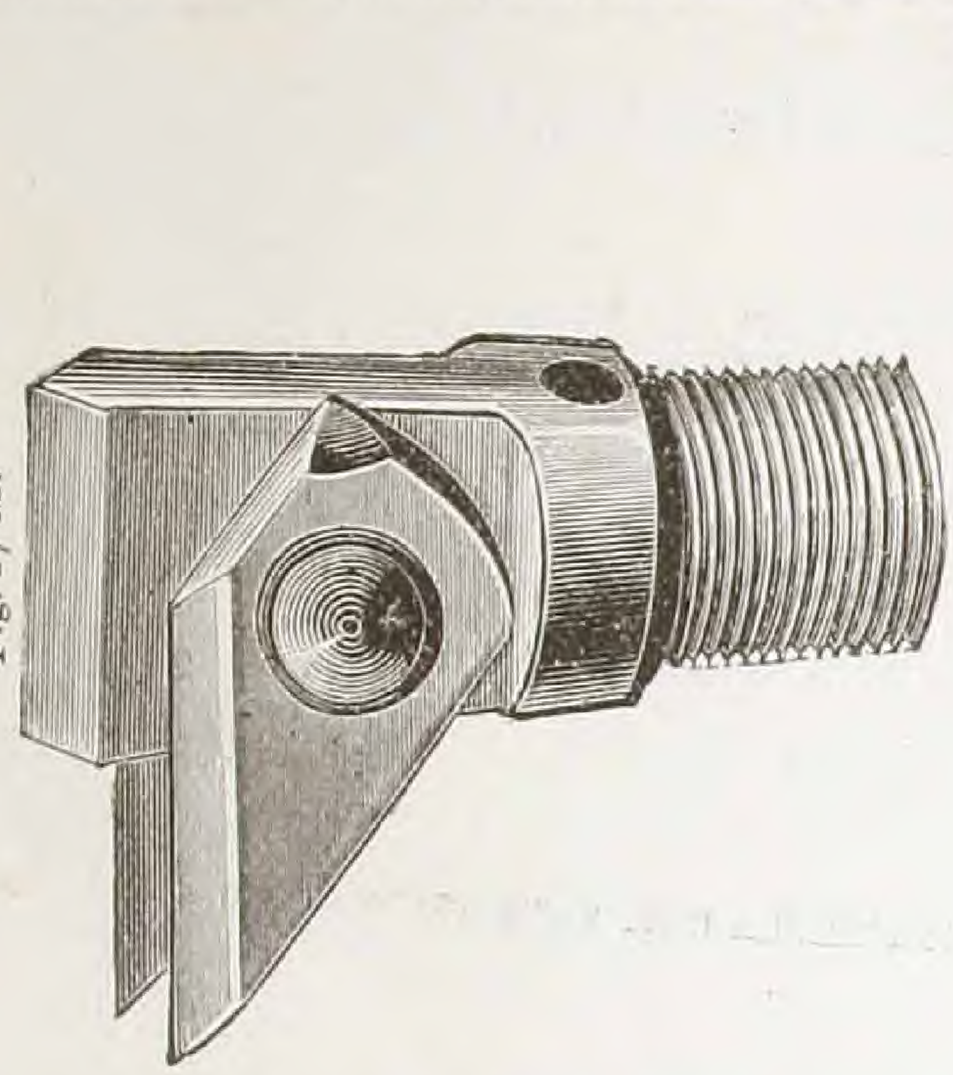


Fig. 27 M.

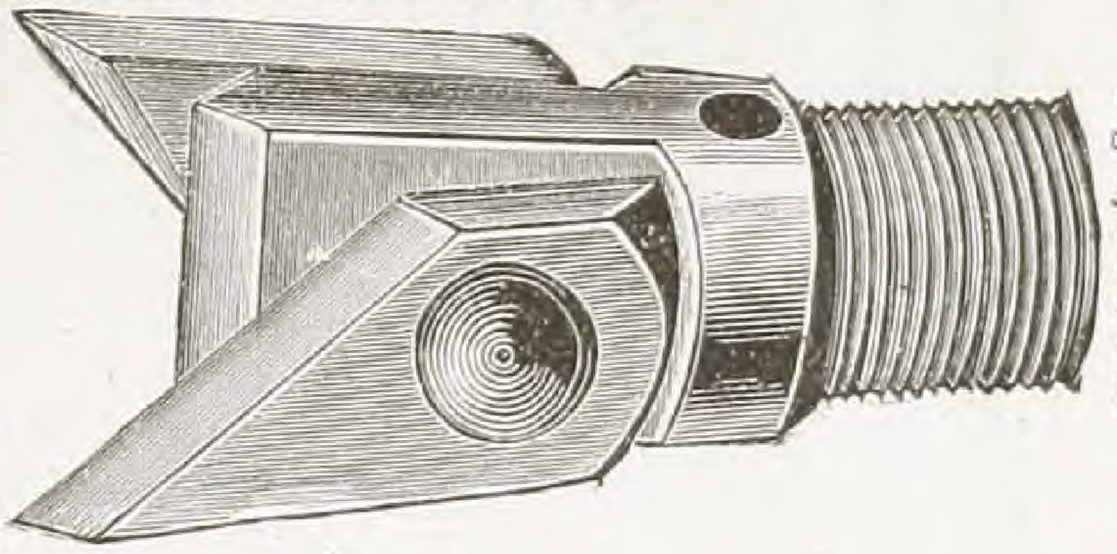


Fig. 27 P. Closed.

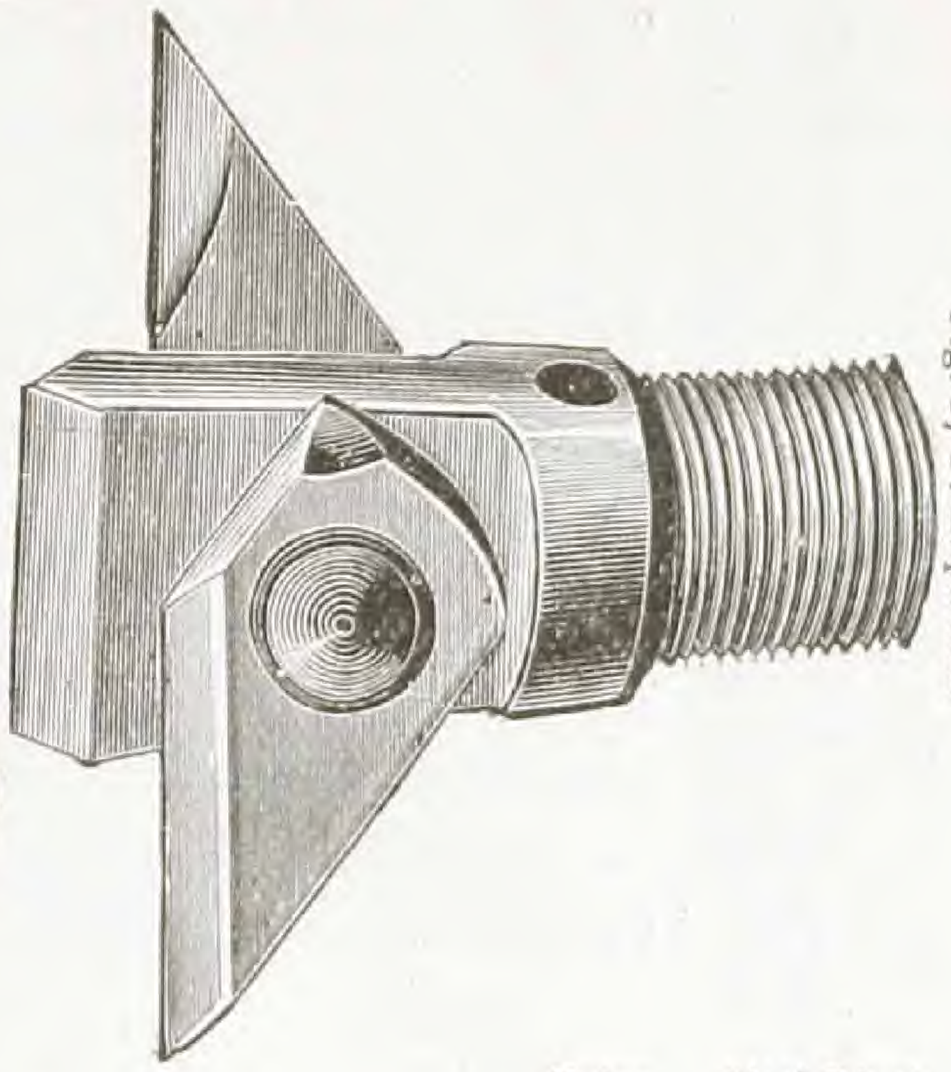


Fig. 27 P. Expanded.

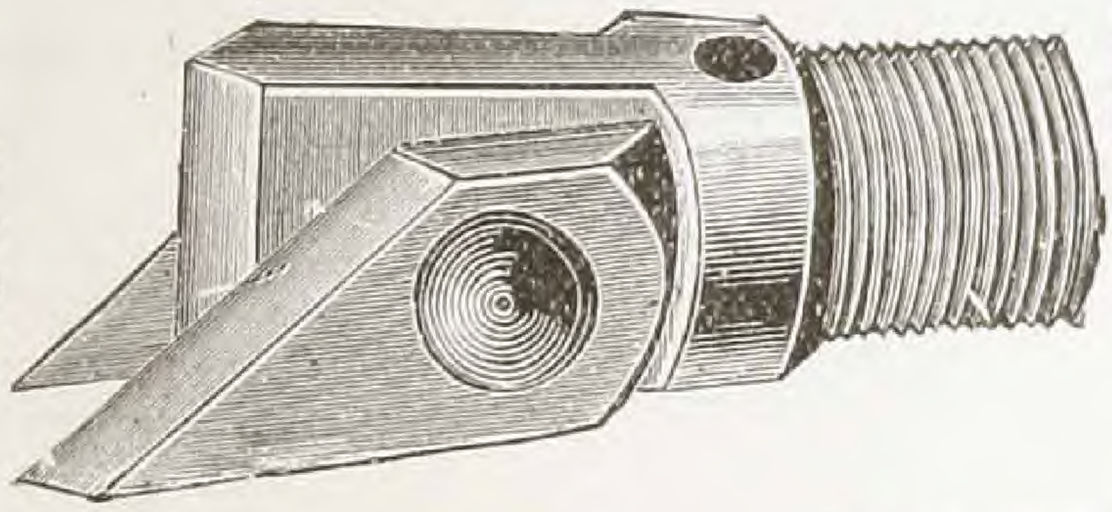


Fig. 27 M.

Fig. 27 P.

								Extra Wings.	*Steel Rivets. Homogeneous.*
2-inch	Paddy,	makes a	3-inch	hole	(bacon)		$5 00	$1 50	25 cents.
2 "	"	"	4 "	"	(balance)		5 50	1 75	25 "
2½"	"	"	3½"	"	(balcony)		6 00	2 00	30 "
2½"	"	"	4½"	"	(ballast)		6 50	2 25	30 "
3 "	"	"	4 "	"	(baloon)		7 50	2 50	35 "
3 "	"	"	5 "	"	(bolsem)		8 50	2 75	35 "
4 "	"	"	5½"	"	(bamboo)		10 00	3 50	50 "
4 "	"	"	6½"	"	(banner)		11 00	3 75	50 "
5 "	"	"	6½"	"	(barley)		14 00	5 00	75 "
5 "	"	"	8 "	"	(barrel)		15 00	5 50	75 "

Fig. 27 M.

Fig. 27 M, Monkey, same price as the Paddy, and does similar work. We have greatly improved these Expansion Drills since getting out the above cut.

I consider your Paddy Drill the greatest improvement of the age. I would not be without it. The last well I made I struck the hardest kind of clay; an auger would not work in it, so I put on the Paddy Drill and in two hours made 30 feet and struck water. I had to hold the casing back. The well is 130 feet deep. JAY VAN DERVOLGEN.

Batavia, Ill., March 17, 1884.

We have used your Paddy Drill the past season and find it to be just what you claim for it. It works to perfection. Do not know how we could get along without it. With us hard pipe driving is a thing of the past. DAVIS & HAAS.

Union, Iowa, March 24, 1884.

On April 1st, 1884, we put your Paddy Drill into a 3½-inch pipe which was down 720 feet deep, and on April 10th we had sunk the casing to a depth of 973 feet; in nine days we sunk 253 feet, drilling a large hole for the casing go down, and the drill has not been taken up yet; we are now in quicksand. This well is to furnish water for making ice for the D. W. Floweree Ice Co. The drill cuts a 6-inch hole. M. T. CHAPMAN.
M. E. LINNIKEN.
M. H. HEMPHILL.

Vicksburg, Miss., April 12, 1884.

Hydraulic Rock Drilling Pump and Jars Combined.

This is a very useful Drill in sandstone, soapstone and rock that is not very hard. It combines in itself drill, plunger, suction pump and jars, and works in harmony with the hydraulic tools.

Price complete for well 2 inch, $30.00; 2½ inch, $35.00; 3 inch, $40.00; 4 inch, $50.00.

CHAPMAN'S PATENT WELL TESTER AND CLEANER.

Fig 19.

It is used in finishing a well, cleaning and testing it for water. It combines check valve, cylinder and plunger, and is used with the regular hydraulic well rods. It has these advantages:

1st.—It can be inserted into the well and removed altogether, at once.

2nd.—It will clear the screen of sand.

3rd.—It will unseat the check valve, when the screen clogs; clean it and go pumping again.

4th.—With it you can thoroughly and satisfactorily test the well for amount of water, without putting on the regular pump.

Description and Operation.

The tube S E is small and long enough to reach nearly to the bottom of the screen, within say 6 inches. D is the packing for the check valve A, which packs by being forced down the same as Chapman's well valves. The water passes up through A and out into the well through F; it again enters F as the plunger B comes down, and then its operation is like any pump, and the water comes up out of the pipe rods or drilling tools and is delivered above ground. This simple devise is easily understood when seen, and cannot fail to suit practical well men.

Size of well to be used, in inches—for	2	2½	3	3½	4	5	6
Price	$15 00	20 00	25 00	30 00	35 00	40 00	50 00

NEW AND IMPROVED SAND DRILL.

This Drill is designed to be used with the hydraulic and jetting tools to work in sand or gravel, and is so constructed on the lower end with partitions, which will not admit of anything entering the drill larger than will pass through the orifice of the valve, thus overcoming the trouble heretofore experienced, of course gravel clogging the valves. It is provided with a clapper valve, for using with hydraulic tools, which is not needed with the jetting. It is made of the best cast cast steel, and warranted to work as represented.

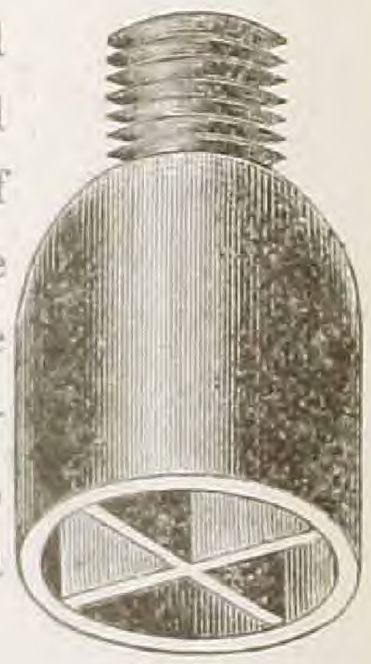


Fig. 7.

2 inch,	$4 00	4 inch,	$ 8 00
2½ "	5 00	5 "	10 00
3 "	6 00	6 "	12 00

GRABS OR FISHING TOOLS FOR CHAPMAN'S HYDRAULIC WELLS.

Size of iron pipe, inches	1	1¼	1½	2	2½	3	4
Strainer Grab	$1 00	$1 25	$1 50	$2 00	$2 50	$3 00	$4 00
Check Valve Grab	----	----	----	2 00	2 50	3 00	4 00
Spring Grab, for taking up broken rods	----	----	----	2 00	2 50	3 00	4 00
Friction Grab, female pattern	1 00	1 25	1 50	2 00	2 50	3 00	4 00
Casing Grab, for taking out well casing if broken off	----	3 00	3 50	5 00	6 00	8 00	15 00
Male and Female Grab, for taking out split pipe	----	2 50	3 00	4 00	5 00	6 00	8 00
Screw Pointed Grab, cast steel	2 00	3 00	4 00	6 00	8 00	10 00	15 00
Uncoupling Tongs, or wrenches, with eye and lever, to hold the bottom pipe to unscrew the top one	----	----	----	10 00	11 00	12 00	14 00
Pipe Drawing Collars, to pull pipe when using Jack Screws	----	----	----	2 00	3 00	4 00	7 00

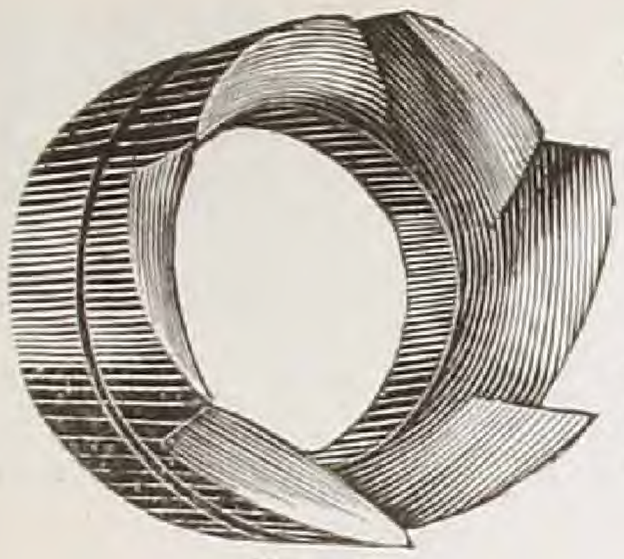


Fig. 23.

COMBINATION REAMER DRILL.

Used to enlarge a hole through hard and thin rocky beds. Instructions how to use it given to parties having tools.

2-inch (balsam)----------$15 00 2½-inch (ballot)----------$17 00
3-inch (bandbox)----------$20 00

STEEL SHOE, OR REAMER—Fig. 23.

Fig. 23 is a steel shoe, or reamer, which is screwed onto the lower end of the tube, and has cutting edges like a saw. It reams the hole by turning the tube or driving it down. This is one of the most practical tools used. We also have a plain steel comb.

2-inch Tool (acre)----------$2 50
2½ " " ---------- 3 00
3 " " ---------- 3 50

SOLID ROD WRENCHES.

Fig. 77.
For Solid Drill Rods.

For two-horse power outfit (juriet)----------$ 6 00
For four " " " (janior)---------- 10 00

VALVE GRABS.

Fig. 29.
For taking out Check Valves.

2-inch Grab (bound)----------$2 00
3 " " (beck)---------- 3 00
4 " " (bath)---------- 4 00

HYDRAULIC FORCE PACKING.

Fig. 104.

1 inch, for 2 inch wells (nt)----------$ 2 00
1 " 2½ " (fuel)---------- 3 00
1¼ " 3 " (fately)---------- 5 00
2 " 4 " (field)---------- 8 00
3 " 6 " (fret)---------- 10 00

HYDRAULIC BLIND VALVES.

Fig. 58.

To fit 1-inch pipe, for 2-inch well (fate)----------$ 2 00
" 1¼ " " 3 " (fite)---------- 4 00
" 2 " " 4 " (field)---------- 8 00
" 3 " " 6 " (first)---------- 16 00

LIFTING AND HOLDING TONGS.

Fig. 33.
Forged of solid iron and best steel.

For ¾ inch pipe (banana)----------
For 1 " " (bed)----------
For 1¼ " " (barter)----------
For 1½ " " (basin)----------
For 2 " " (bal)----------

SLIDING TONGS.

Fig 30.

	For 300-ft. wells.	*For 500-ft. wells.*	*For 1,000-ft. wells.*
For ¾ inch pipe (banana)----------	$ 5 00	------	------
For 1 " " (bed)----------	6 00	------	------
For 1¼ " " (barter)----------	7 50	8 00	10 00
For 1½ " " (basin)----------	8 00	10 00	12 00
For 2 " " (bal)----------	10 00	12 00	14 00

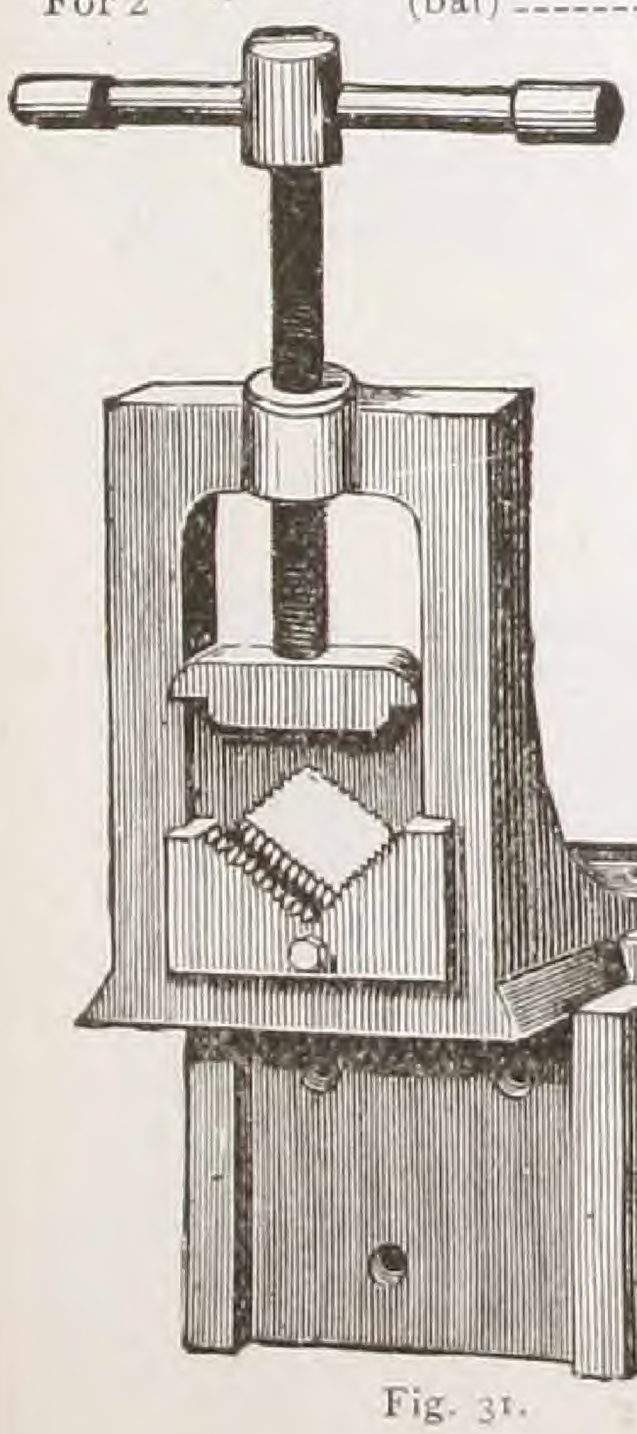


Fig. 31.

AMERICAN PIPE PULLER.

For pulling out pipe broken under ground.

Fitted for ¾ inch pipe, to pull 1¼ inch pipe (balm)----$ 5 00
" ¾ " " 1½ " (bail)----- 6 00
" ¾ " " 2 " (brake)--- 7 00
" 1¼ " " 3 " (brink) --- 10 00
" " " 4 " (buskin)-- 15 00

PIPE VISES.

No. 1—With Angle Plate.

Holds pipe from ⅛ to 2 inches----------$12 00
Same, without Angle Plate---------- 10 50

No. 2—With Angle Plate.

Holds pipe from ⅛ to 3 inches----------$18 00
Same, without Angle Plate---------- 16 00
Vice Jaws, cast cast steel---------- 1 00

Fig. 32 is a very strong and durable Pipe Vise, and has an A No. 1 babbitted thread and cast steel jaws.

Price, holds ¼ to 3 inch pipe (dive)--$16 00

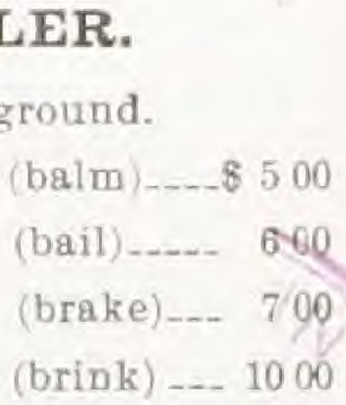


Fig. 32.

DIE-STOCK AND DIES—Extra Quality of Steel.

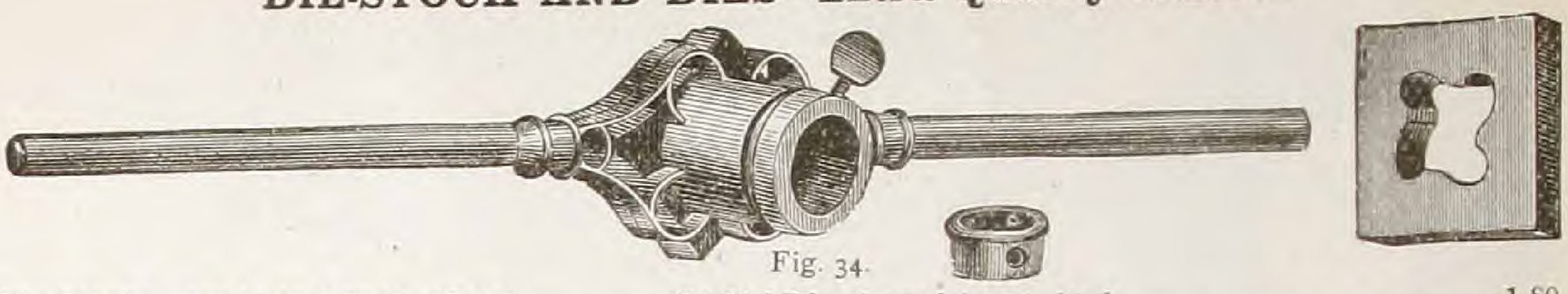


Fig. 34.

Die-Stocks,	cut ¼ to 1 inch	(date)	$14 00	Dies from ¼ to 1 inch	1 80
"	" 1½ to 2 "	(do)	19 00	" " 1¼ to 2 "	3 35
"	" 2½ to 3 "	(dag)	45 00	" " 2½ to 3 "	9 00

ALL WITH LEADER SCREWS.

TAPS AND REAMERS.

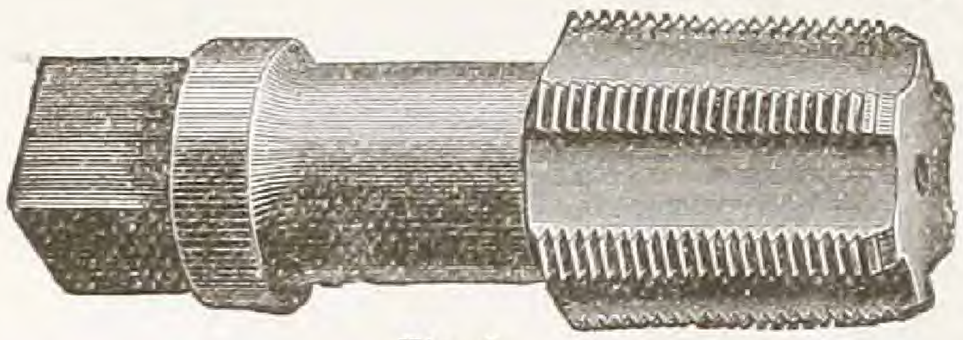


Fig. 95.

Fig. 96.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Taps and Reamers	.75	.85	1.00	1.25	1.65	2.15	2.50	3.15	4.25	7.00	10 00

PIPE TONGS.

COMMON.

MADE EXTRA HEAVY AND STRONG.

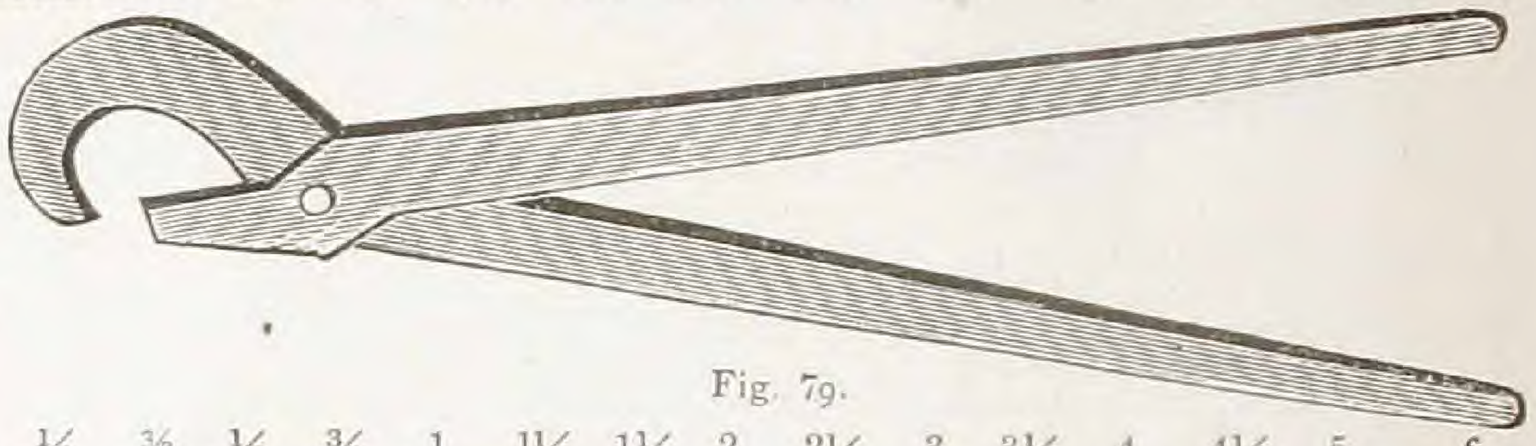


Fig. 79.

Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price	1.10	1.10	1.10	1.20	1.30	1.50	1.85	2.30	2.85	3.50	4.25	5.25	6.25	7 25	8 25	10 50
Mark	(east)	(eat)	(ed)	(edd)	(edy)	(ell)	(elb)	(end)	(eby)	(ech)	(eli)	(ett)	(eby)	(eza)	(evil)	(eject)

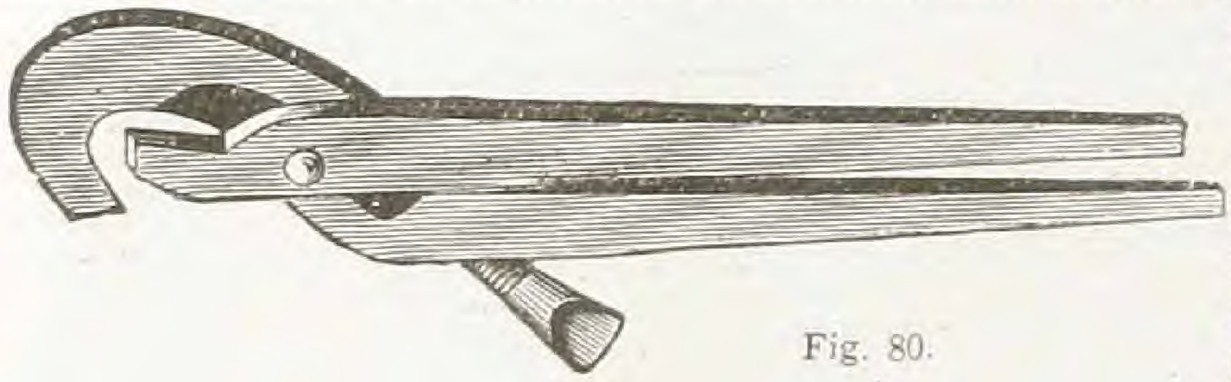


Fig. 80.

BROWN'S PATENT PIPE TONGS.

No. 1, for pipe	⅛ to ¾ in.	(efiort)	$3 00
No. 1½ "	¼ to 1 "	(efiorting)	3 50
No. 2 "	½ to 1¼"	(elasso)	4 00
No. 3 "	1 to 2 "	(enos)	5 00
No. 4 "	1½ to 3 "	(easy)	9 00

STANWOOD'S PIPE CUTTERS

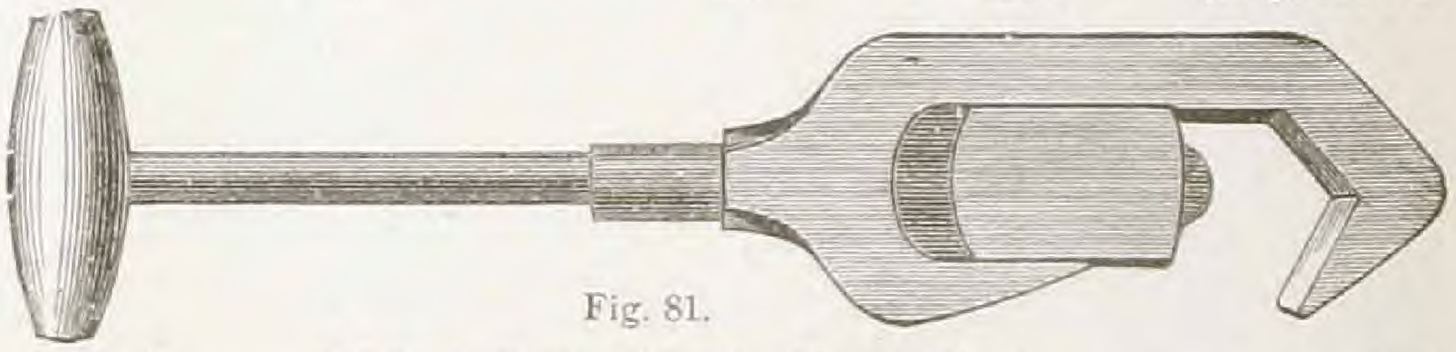


Fig. 81.

No. 1, cuts	⅛ to ¾ inch pipe	(ease)	$ 7 50	Cutter Wheels, No. 2	(ellen)	$ 50
No. 2, "	¾ to 2 "	(embris)	9 00	" " No. 3	(enoch)	75
No. 3, "	2 to 3 "	(ember)	18 00	Cutter Blocks, No. 1	(ept)	75
Cutter Wheels, No. 1	(elm)		40	" " No. 2	(extra)	1 00

Fig. 82.

CHAPMAN'S CHAIN TONGS.

PATENTED MARCH 7, 1882

We have made some valuable improvements in these Tongs, which are not shown in this cut. They cannot slip, and will do more work than any other Tongs made. Special price to the trade.

No. 2, Chain Tongs, holds pipe	⅛	to 3	inches	(evening)	$ 5 00
No. 3, "	"	"	"	¾	to 4	"	(exist)	7 00
No. 4, "	"	"	"	1	to 6	"	(exercise)	10 00
No. 5, "	"	"	"	1½	to 8	"	(explain)	14 00
No. 6, "	"	"	"	2	to10	"	(enspire)	18 00

AMERICAN PIPE REAMER.

FOR REAMING THE ENDS OF PIPE.

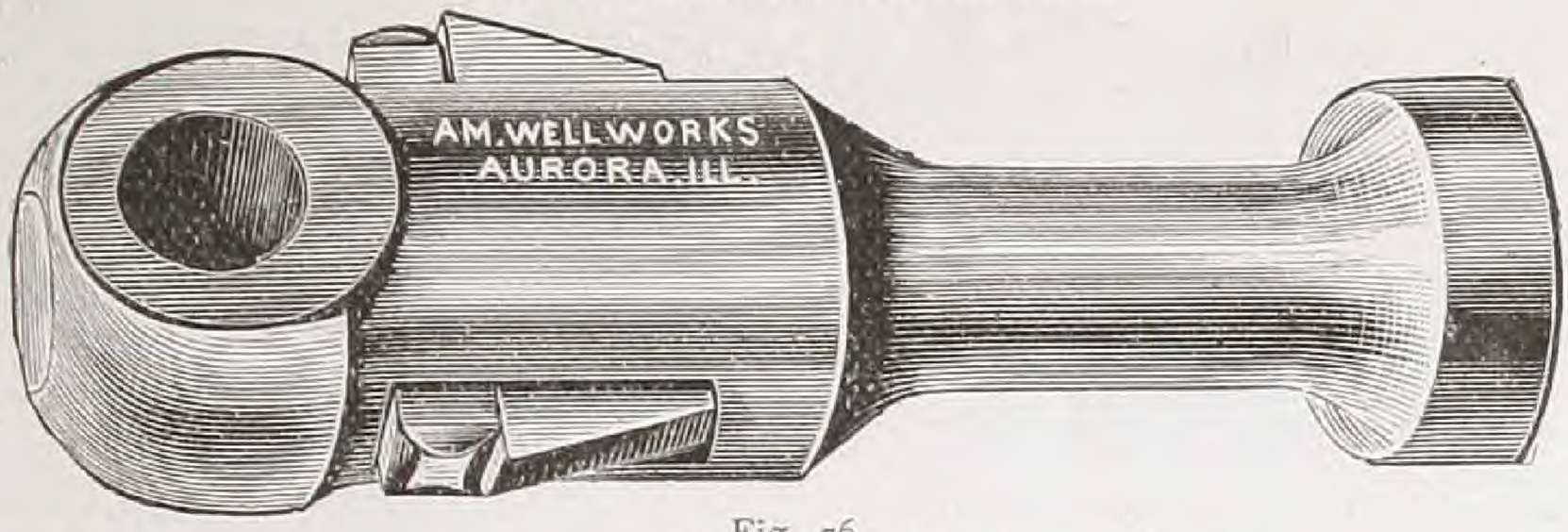


Fig. 76.

For 2 inch pipe (butterfly)	$3 00	For 3 inch pipe (bursar)	$6 00
For 2½ " (blizzard)	4 00	For 4 " (burnet)	8 00

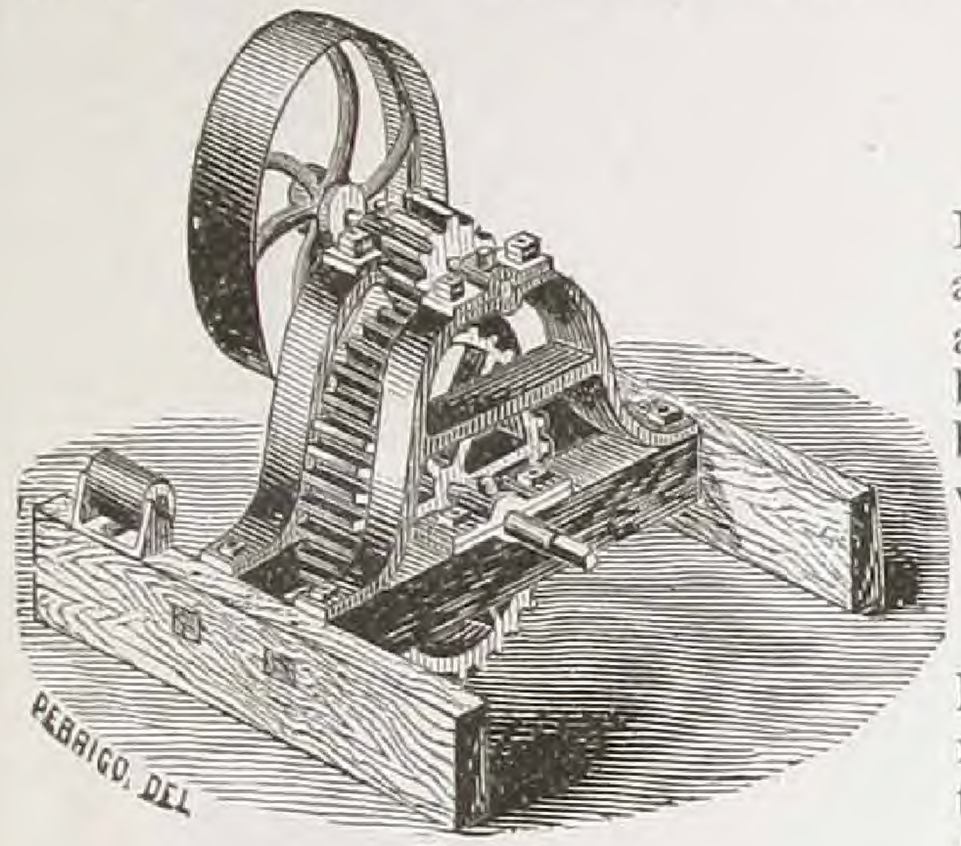


Fig. 94.

NO. 8—COMMON SPUR JACKS.

TO INCREASE THE MOTION.

Stong, compact and durable; used with our Two, Four and Six-Horse Powers, but strong enough for any power up to ten-horse. Transmits the motion at a right angle with the tumbling-rod, and gives band wheel FOUR revolutions to one of any tumbling rod with which it may be connected. Price, with band wheel, (flag) $25.00.

CHAPMAN'S IMPROVED JACK.

Our Improved Straight Jack, for one or two-horse powers, increases the speed of the tumbling rod four times, and with either rope or belt pulley, this is the best arranged Jack. Price, (powerjack) $20.00.

THE AMERICAN CASING PULLER.

This is used when pulling the casing with the Jack Screws. The Puller is placed on top of two jack screws; the wedges A are so shaped that the greater the strain the tighter they hold. There is no danger of the casing slipping when using this. All practical well men will appreciate this tool.

Fig. 11.

To hold 2-inch and 3-inch pipe, price	$10 00
" 3 inch and 4-inch " "	15 00
" 4 " " 5 " "	20 00
" 5 " " 6 " "	25 00

WROUGHT IRON JACK SCREWS.

Diameter of Screws.	*Hight of Stand.*	*Hight, Over All.*	*Price.*
2 "	14 inches	18½ inches	$8 25
2 "	16 "	20½ "	9 25
2½"	18 "	24 "	14 50

Fig. 35.

WELL DERRICK PULLEY.

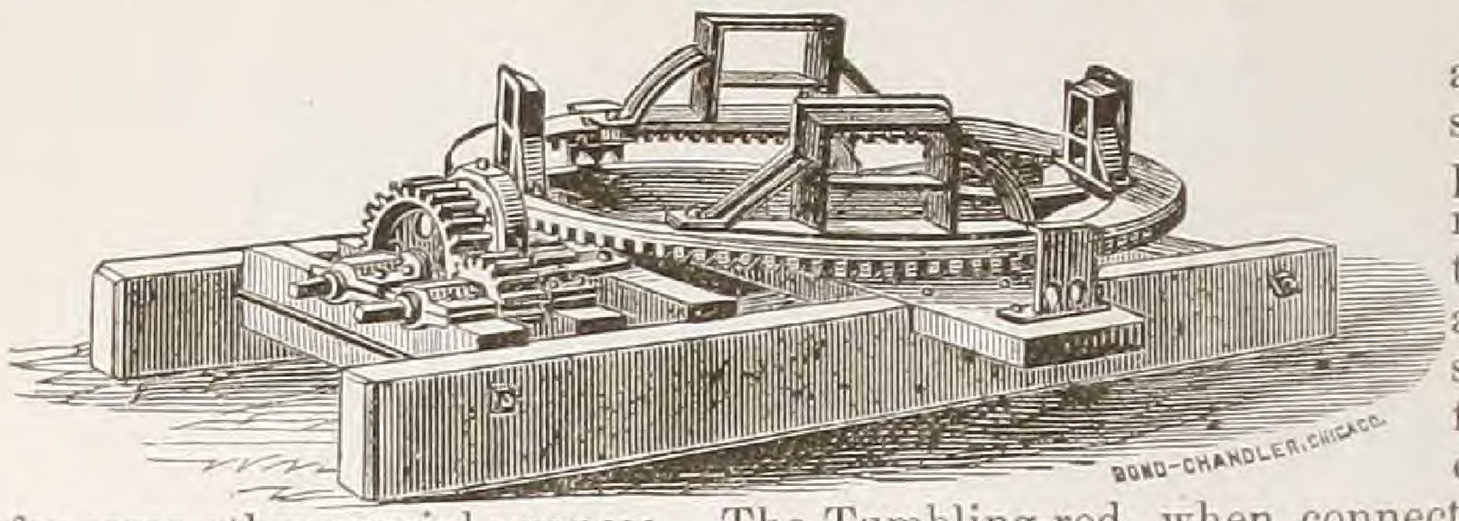
Our Single Block Well Derrick Pulley weighs 30 pounds, is turned and bored in a lathe, and the bearing on spindle is 4 inches long and can be taken out to be oiled. This is a perfect article, and has wood sides so the rope does not chafe.

Single Block Pulley,	$ 5 00
Double " "	10 00
Treble " "	15 00
Four " "	20 00

Fig. 12.

Pulley Wheel.

NO. 4—FOUR-HORSE DOUBLE GEARED.



This Power is the same as No. 1 Power, with a second shaft, enabling parties owning drilling machines to connect with the first shaft and operate machines, and at the same time have a power from which a still higher speed can be obtained, for some other special purpose. The Tumbling-rod, when connected with the first shaft, gives the same speed as No. 1 Power, but when connected with the SECOND SHAFT, has seventy-four revolutions per minute, and when connected with our No. 8 or No. 9 Jacks, would give their band-wheel shafts about three hundred revolutions per minute. This power, like No. 1, is in active demand for a variety of uses. Price, with Levers, one Tumbling-rod and one Safety coupling (Fitly), $85 00.

☞ We will arrange the motion of these Powers to suit any machinery, according to plan.

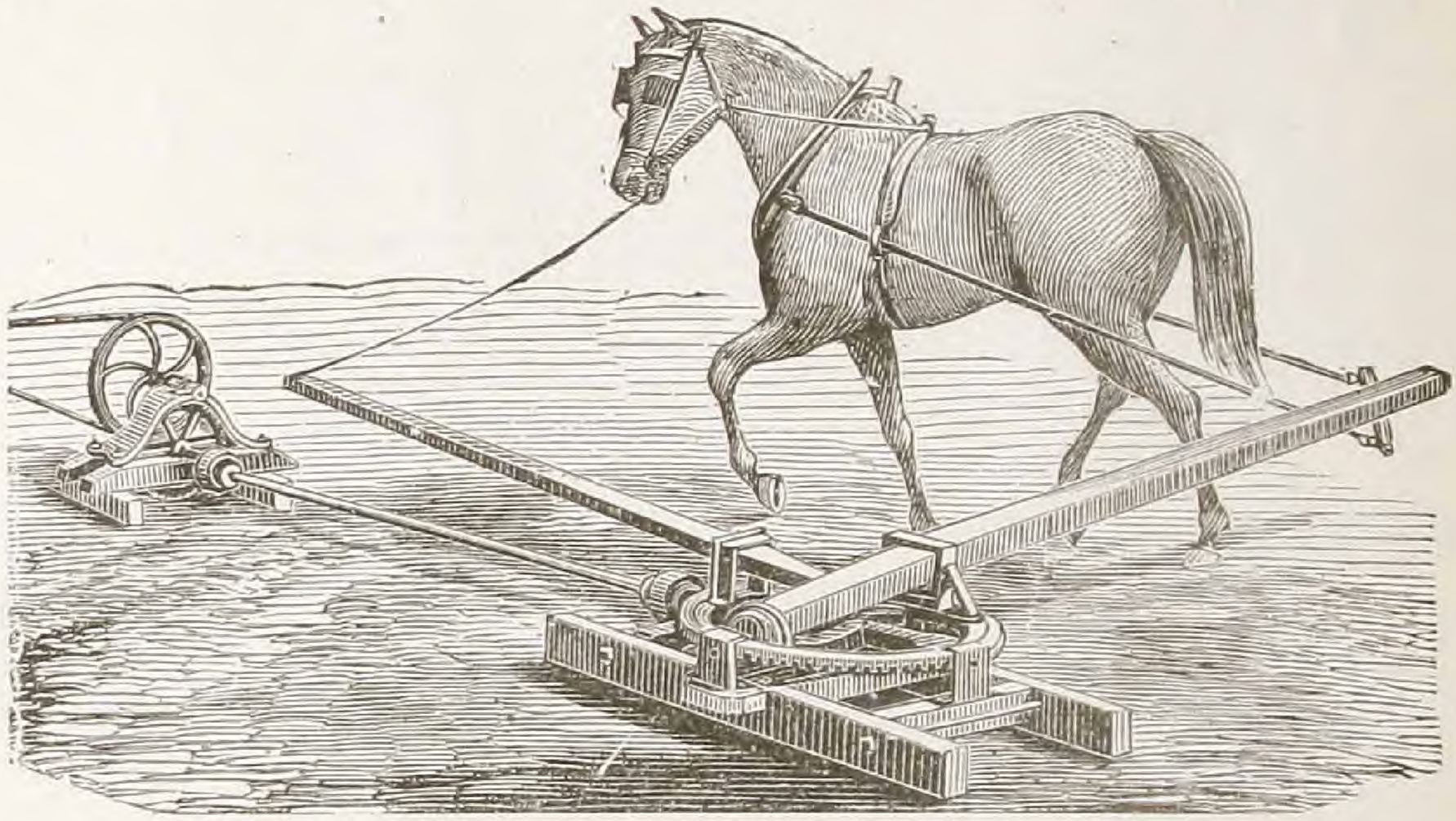


Fig. 71.

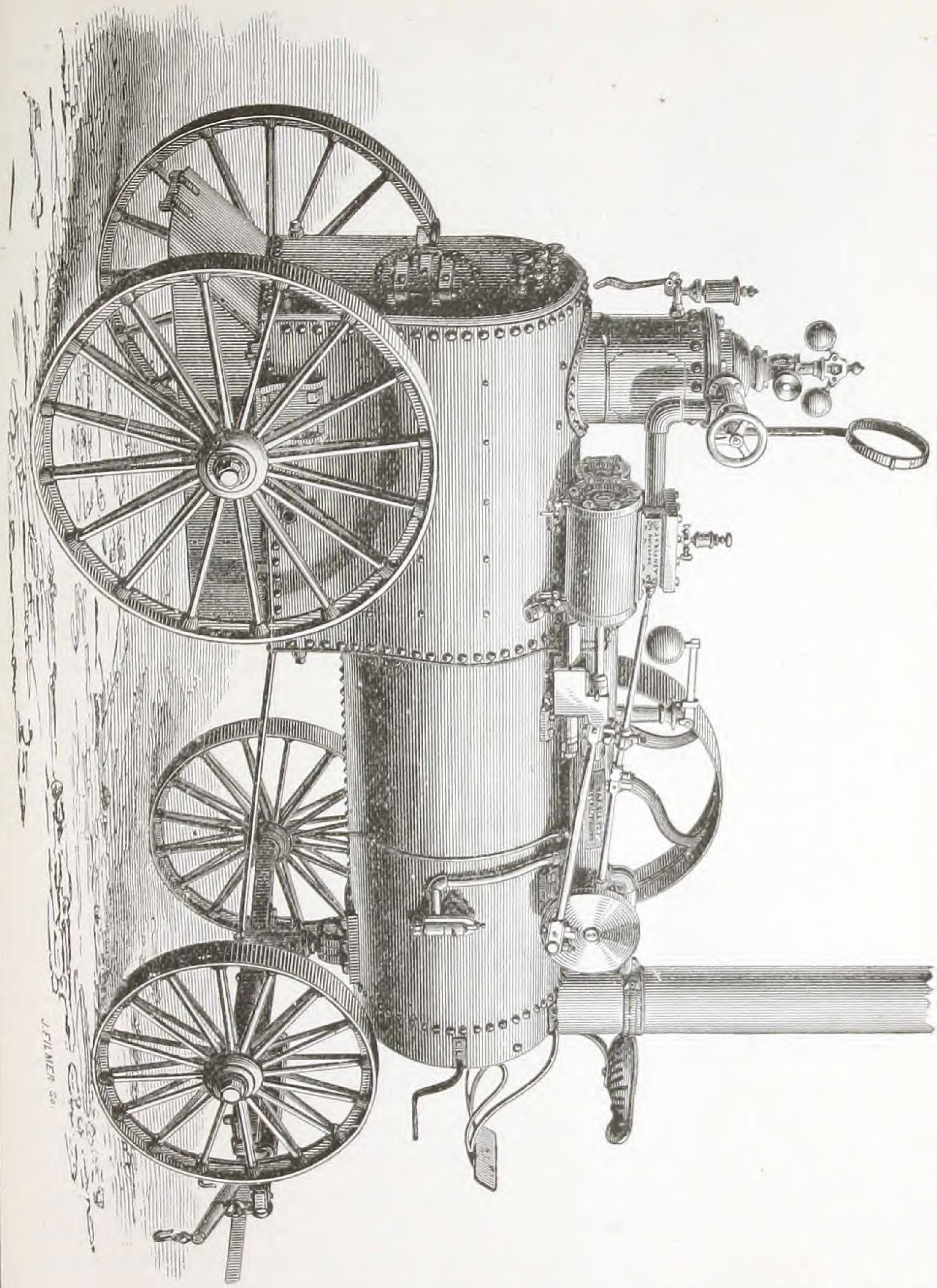
This cut shows our Improved Horse Power. We make them from one to eight-horse power.

No. 1 One-Horse Power, single gear (fisk) ..... $35.00, double gear (Fiskey) $40.00
No. 2 Two-Horse " " " (fire) ..... 55.00, " " (flew) 70.00
No. 4 Four-Horse " " " (flail) ..... 70.00, " " (fitly) 85 00

No. 5 is our Eight-Horse Giant Power, very heavy, for drilling, single gear (shuflail), $100.00; double gear (eshufla), $120.00.

REPAIR LIST OF HORSE POWERS.

ARTICLES.	ONE-HORSE POWER.	TWO-HORSE POWER.	FOUR-HORSE POWER.	SIX-HORSE. POWER.
Master Wheel	$9 50 (kail)	$16 50 (kinds)	$21 00 (lac)	$28 00 (lay)
" " Spider, or Centre Hub and Arms	----------	----------	----------	10 50 (lax)
" Pinion	1 25 (keel)	2 00 (kin)	2 00 (lace)	2 75 (law)
Lever Eye for lower pair of levers	----------	----------	----------	3 00 (lea)
" " " upper " "	----------	----------	----------	2 75 (left)
" "	150 (keep)	1 00 (kine)	3 00 (lack)	----------
Lead Eye	1 00 (kern)	1 00 (king)	1 00 (lad)	----------
Arch Slide	1 10 (key)	1 50 (kirk)	1 75 (lade)	1 75 (less)
Power Chairs	60 (kahn)	75 (kit)	75 (lag)	75 (let)
Centre Post	1 35 (keg)	1 35 (kite)	2 00 (laic)	2 50 (ley)
" " Cap	20 (ken)	20 (knap)	20 (lake)	50 (lid)
Power Boxes, babbitted	1 00 (kept)	1 00 (knight)	1 50 (lamb)	1 50 (lien)
Rod Couplings, complete	1 00 (kid)	1 00 (knot)	1 25 (lane)	1 50 (lift)
Horse Power Shaft	1 75 (kiln)	1 75 (knock)	2 25 (lank)	2 25 (line)
Tumbling Rod, 10 feet long, with Couplings	4 50 (kilt)	4 5 (knoll)	5 00 (lap)	5 00 (lip)



The above cut represents our Portable Steam Engine and Boiler. It is built with special adaptation to well sinking, being speeded to suit our Drilling machine; is the most compact, powerful and durable machine made. We also manufacture a cylindrical boiler, with the fire box in but below the centre of the boiler, and the flues arranged on either side, which gives the greatest possible heated surface in contact with the water, consistent with ample capacity for the free generation and accumulation of steam. This arrangement provides for the greatest possible economy of fuel, and is very safe. Write for dimensions and price.

HYDRAULIC LIST.

1 Hydraulic Machine; Horse Power, Tumbling Rod and Knuckles; Derrick, Ladder, Pulley and Fixtures; Manilla Rope—sixty feet; Rod Lifter; 1 Heavy Pipe; Hydraulic Well Rods, to make with the other tools the depth of the well; 1 Drive Head; Tank Fixtures, Hose and Stop Cock; 1 Universal Brace and Bits; 1 Saw, Hatchet and Hammer; 1 set of Files and Cold Chisel; 2 Monkey Wrenches; 1 Pipe Driving Block, Steering Rod and Drive Plate; 1 set of Jack Screws and Fixtures; 1 Pipe Die Stock and Dies; 1 Pipe, Vice, Cutter and Reamer; 2 Pipe Drawing Collars, 2 sizes; 3 Augurs (earth boring), and Lever; 3 Hydraulic Drills and 1 Paddy Drill; 1 Force Packing; 1 set Hydraulic Valves; 3 pair Pipe-Turning Tongs; 2 pair Chain Pipe-Turning Tongs; 1 pair Lifting Tongs; 1 pair Sliding Tongs; 1 set of 4 Grabs; 1 2-feet Rule, 2 Padlocks; 1 Sledge and Swivel; 30 Bolts, 16 Pipe Fittings; 2 Tool Boxes.

HYDRAULIC JETTING LIST.

1 Hydraulic Jetting Drilling Machine, with Pump; Hose and Connection; Hydraulic Tank Fixtures and Stop Cock; Suitable Horse Power, Tumbling Rod and Knuckles; Derrick and Ladder; 2 Manilla Ropes; Rod Lifter; Heavy Pipe; Hydraulic Rods for the required depth; 1 Drive Head; 1 Pulley; 1 Hollow Drive Block; 1 Pipe Puller; 1 Force Packing; 1 set Hydraulic Valves; 2 Hydraulic Drills; 1 set of 2 Jack Screws and Plank; 1 set of 2 Jack Wrenches; 3 Paddy Expansion Drills; 2 serrated Expansion Drills and Reamer combined; 1 Earth and Clay Augur; 1 Cobble Stone Augur; 1 set 12 very heavy Couplings for lower end of Rods; 1 set of 4 Grabs or Fishing Tools; Pipe Tools consisting of 3 pair Brown's Tongs, 2 pair Chapman Chain Tongs, 1 Pipe Vice, Pipe Cutter, Pipe Reamer; Die Stock; 1, 1¼ and 2 Dies; 1 2-foot Rule; Saw; Hatchet and Hammer; Universal Brace and 3 Bits; 1 pair Sliding Tongs; 1 pair Lifting Tongs; 1 set of Casing or Pipe Clamps for one size pipe; a lot of Fittings, Unions and Elbows for Hose, Tees for Casing, Wrought Iron Bushings or Reducers, Rubber and Hemp Packing; 2 Tool Boxes and Locks.

The many improvements made since our last catalogue necessitates a slight change in the price list.

The above described sets of the Chapman Hydraulic and Jetting Well Sinking Tools are specially designed for the depths calculated, for they will work in all the following named substances: Soil, red, yellow, blue and fire clay, slate, soapstone, shale, rotten lime and sand stone, coal, cemented gravel, hard pan, chalk rock, sea mud, beach sand, conglomerated soft rock, cemented oyster shell beds, hill sand, quicksand of the putty or gritty nature; and their rapidity exceeds all former inventions.

Especially adapted for prospecting.

HYDRAULIC TOOLS.

A SET.

2-Inch 100-Foot Hydraulic Set includes the tools required to make a complete outfit, as seen in figs. 109 and 110, and in the enumerated Hydraulic List, less the barrel, warranted to do what we say they will, and be durable and well made, using a 1-Horse Power and 100 feet of Rods, and making a 2-inch well, and will put in 3-inch Piping—inside measure. Price, $275.

A 1. 2 and 3-inch 100-foot same as A with the addition of 3-inch Drills. Price $285.

A 2. 4 and 6-inch 100-foot same number of Tools as A using C Drilling Machine and a 2-Horse Power, having suitable rods and tools to handle them, with 4 and 6-inch Drills. Price, $410.00.

B SET.

2-Inch 150-Foot Hydraulic Set the same number and kind of tools as in A Set but heavier, using a 2-Horse Power and 150 feet of Rods. Price, $295.00.

C SET.

2-Inch 200-Foot Hydraulic Set the same number and kinds of tools as in B Set, but using 200 feet of Rods, light balance Jack, to give a steadier motion, and heavy enough for the work. Price, $350.00.

D SET.

2 or 3-Inch 300-Foot Hydraulic Set, as enumerated in Hydraulic List, is proportionably heavier than C Sets, and has an extra balanced Jack to give a more steady motion, with 300 feet of Rods and two Tumbling Rods. With this and all larger sets the Casing Puller, page 24, is included. Price, $380.00.

D 1. 4 and 6-inch 300-foot same number of tools as D using E Drilling Machine and Horse Power, suitable heavy Rods and Tools to handle them with 4 and 6-inch Drills Price, $500.00.

E SET.

2 and 3-Inch 400-Foot Hydraulic Set has a 4-Horse Power, 400 feet of Rods, has same number and kind of tools as in Hydraulic List, extra 1 ¼-inch Lift and Slide Tongs, and 3-inch Paddy. Has Belt Driving Jack attached, and Multiplying Power Tackle, to ease the raise of the tools. Price, $425.00.

F SET.

2 and 3-Inch 500-Foot Hydraulic Set, as enumerated in Hydraulic List, has a very heavy 4-Horse Power, of an 8-Horse Power pattern, but fitted to use four horses, with 500 feet of Rods, and includes the special attachment of an E 400-foot Set, only much heavier. Price, $500.00.

H SET.

4 and 6 Inch Hydraulic Wells, 500-Foot, Hydraulic Set, as before listed in Hydraulic List, with a heavy 8-Horse Power, of F Set, using G Drilling Machine or Multiplying Power Tackle, and heavy Rods suitable for this large set. Price, $650.00.

G SET.

2 and 3-Inch 600-Foot Hydraulic Set includes all that is in Hydraulic List, having the power as described in F Set, and a Drilling Machine and attachments and extras, as stated in E Set, with 600 feet of Rods and Multiplying Power Tackle. Price, $600.00.

Pole or Rope Tools may be used for drilling rock, with H Set, and used to an unlimited depth.

G 1. 4 and 6-inch 600-foot set, same as G, with suitable Drilling Machine, heavy Rods and Tools and 4 and 6-inch Drills. Price, $750.00.

N. B. Any of the foregoing sets are sold without the Horse Power but Drilling Machine fitted for engine at a reduction of 6 per cent. from List.

COMBINATION HYDRAULIC JETTING

AND

HYDRAULIC TOOLS.

I SET.

2 and 3-inch 300-foot Combination Jetting and Hydraulic Set includes the Hydraulic Jetting List, using I Hydraulic Jetting Machine and 2-Horse Power. Price, $500.00.

I 1 SET.

4 and 6-inch 300-foot Combination Jetting and Hydraulic Set same number of Tools as I Set, using I 3 Hydraulic Jetting Machine and 4-Horse Power and double Pulley Block with 4 and 6-inch Drills. Price, $700.00.

I 2 SET.

2 and 3-inch 400-foot, includes Hydraulic Jetting List, using I 2 Hydraulic Jetting Machine and 4-Horse Power, and Multiplying Power Tackle to ease the weight of Tools. With this and larger sets a Water Guage is included. Price, $575.00.

I 3 SET.

2 and 3-inch 500-foot, includes Hydraulic Jetting List, using I 3 Hydraulic Jetting Machine, has a very heavy 4-Horse Power of an 8-Horse Power pattern, but fitted to use four horses. Price, $650.00.

K SET.

4 and 6-inch 500-foot uses the J Hydraulic Jetting Machine, 4 and 6-inch Drills with suitable heavy Rods and Tools to handle them and Multiplying Power Tackle. Price, $800.00.

J SET.

2 and 3-inch 600-foot includes the Hydraulic Jetting List, uses the Horse Power of F Set and J Hydraulic Jetting Machine. Price, $700.00.

J 1 SET.

4 and 6-inch 600-foot using J 1 Hydraulic Jetting Machine, 4 and 6-inch Drills, heavy Rods and Tools and treble Pulley Block. Price, $900.00.

N. B. Any of the foregoing sets are sold without the Horse Power, but Drilling Machine fitted for Engine at a reduction of 5 per cent. from List.

HYDRAULIC AND JETTING SETS WITH ROCK DRILLS.

C R is C Set with 2-inch Z Drill and solid Bar	$380.00
D R is D Set with 2-inch Z Drill and solid Bar	410.00
D 1 R is D 1 Set with 4-inch Z Drill and solid Bar	540.00
E R is E Set with 2-inch Z Drill and solid Bar	450.00
F R is F Set with 2-inch Z Drill and solid Bar	530.00
H R is H Set with 4-inch Z Drill and solid Bar	710.00
G R is G Set with 2-inch Z Drill and solid Bar	630.00
G 1 R is G 1 Set with 4-inch Z Drill and solid Bar	810.00
I R is I Set with 2-inch Z Drill and solid Bar	530.00
I 1 R is I 1 Set with 4-inch Z Drill and solid Bar	760.00
I 2 R is I 2 Set with 2-inch Z Drill and solid Bar	605.00
I 3 R is I 3 Set with 2-inch Z Drill and solid Bar	705.00
K R is K Set with 4-inch Z Drill and solid Bar	860.00
J R is J Set with 2-inch Z Drill and solid Bar	730.00
J 1 R is J 1 Set with 4-inch Z Drill and solid Bar	960.00

The above sets will work in any rock that steel will penetrate. If rock of an adamantine nature is struck, our Diamond Bit and Rotary Attachment can be used. Write for price.

If you will describe the soil you expect to make Wells in, we will recommend tools to suit.

We will contract to make Hydraulic Wells with our *Hydraulic* Tools with our Z Drills solid rods attached, any place you wish before sale. Everything we make is *A No.* 1, and we warrant every article to be well made and suitable for its uses. Any flaws or imperfections in workmanship will be made good, and upon notice of such defect we deliver, free aboard cars here, any article found defective. As we own and run our own works, and are practical men, we do not think that you can get a better class of work done than we are turning out; besides, we have so many valuable Patents, that it seems to us that ours is so far ahead of other methods that it would be useless for you to use others, knowing the superiority of our goods. Cheap goods are dear at any price, even for making Wells when the work done is often hundreds of feet from you.

MOUNTED STEAM ENGINES.

HYDRAULIC AND HYDRAULIC JETTING SETS.

A E is D Set, less the Horse Power, with 4-H. P. Mounted Steam Engine	$ 760.00
A E 1 is I Set, less the Horse Power, with 4-H. P. Mounted Steam Engine	880.00
A E 2 is D 1 Set, less the Horse Power, with a 4-H. P. Mounted Steam Engine	880.00
A E 3 is I 1 Set, less the Horse Power, with a 4-H. P. Mounted Steam Engine	1,080.00
A F is E Set, less the Horse Power, with 6-H. P. Mounted Steam Engine	1,175.00
A F 1 is I 2 Set, less the Horse Power, with 6-H. P. Mounted Steam Engine	1,325.00
A G is F Set, less the Horse Power, with 8-H. P. Mounted Steam Engine	1,400.00
A G 1 is I 3 Set, less the Horse Power, with 8-H. P. Mounted Steam Engine	1,525.00
A G 2 is H Set, less the Horse Power, with 10-H. P. Mounted Steam Engine	1,675.00
A G 3 is K Set, less the Horse Power, with 10-H. P. Mounted Steam Engine	1,825.00
A H is G Set, less the Horse Power, with 10-H. P. Mounted Steam Engine	1,625.00
A H 1 is J Set, less the Horse Power, with 10-H. P. Mounted Steam Engine	1,725.00
A H 2 is G 1 Set, less the Horse Power, with 10-H P. Mounted Steam Engine	1,775.00
A H 3 is J 1 Set, less the Horse Power, with 10-H. P. Mounted Steam Engine	1,925.00
A K Set for making 1,000 feet, includes the Hydraulic Jetting List, J 1 Hydraulic Jetting Machine, and makes 4 and 6-inch Wells, using a 12-Horse Power Mounted Engine with portable forge, anvil and blacksmith's Tongs. This is a very perfect set, and can be fitted for any depth	2,250.00

Wood Pole Tools for Rock Drilling.

This class of tools is used for Rock Drilling, where there is clay and stone alternately, as rope gets loaded with mud by its vibration; but the Rod has a smoother surface, and a Jar, which prevents its being loaded. We cannot here give the details and peculiar condition under which the different tools are best adapted, but we shall consider it a pleasure, and part of our business, to select a set of tools best adapted to your section of country, and to give you such information as will enable you to operate *the tools successfully*.

Wood Poles are about 2-inch diameter, 18 feet long, and two are spliced together with straps of iron riveted through. Rod joints are put on each end that have a Male and Female Tapering Screw.

AI SET.

Wood Pole Rock Tools for 1,000 ft. 4-Inch Hole includes:

27 Set of Rod Joints @ $5.00	$135.00
27 " Straps @ $1.00	27.00
60 Ash Poles @ 18c	10.80
1 Set of 4-inch Jars of Swede's Iron	35.00
4-inch Z Drill	30.00
4-inch Concave Wedge Bit	24.00
Sinker Bar, 12 feet, with Box and Pin	18.00
1 Drill Gauge	3.00
Auger Stem, 16 feet, with Box and Pin	22.00
1 Pair of Wrenches	20.00
100 feet of 2-inch Rope	20.00
1 Swivel	8.00
1,000 feet 1-inch Sand Pump Rope	45.00
1 Patent Sand Pump and Jars	30.00

(There is no Temper Screw needed with our Drilling Machine; it is provided with a Feed in itself.)

DRIVE WELL SET.

O SET.

Drive Well Tools. Includes a 1-Horse Power Driving Machine, Drive Block 300 lbs., Derrick and Fixtures, and is the best article for driving wells known. (Rod, Augurs and small tools extra.) This set of tools is used in driving wells. Price, $100.00.

HAND TUBULAR WELL SET.

Q SET.

100-foot Tubular Hand Set includes 100-foot Boring Rods, 4 pair of Adjustable Tongues, 1 pair of Slide Tongs, 1 Pulley, 1 Rope, 1 Pipe Lifter, Derrick Irons and Link for Pulley, 1 Drive Head, 1 3-inch Augur and Lever, 1 Sand Pump and Drill combined, 1 Driving Block, 1 Sledge Pipe Vise, 2-inch Die Stock and Pipe Cutter, Derrick Windlass, Irons and Bolts. You have just such a set of tools as we started this business with, and you can make money with them and soon be able to get an Hydraulic Set. Price, net, $100; cash with the order.

ROPE OR CABLE TOOLS.

U SET.

200 feet 6-Inch, Rope or Cable Tools includes a 2-Horse Power, 2 Tumbling Rods, an Extra Balanced Chapman Patent Drilling Machine, Graduating Tackle Blocks, to ease the weight of Tools, 1 Drilling Derrick, like Fig. 110, 250 feet of Hawser Cable, 1 6-inch Z Drill and Gauge, 1 set of Heavy Jars, Rope Sacket, a pair of Heavy Wrenches, Jack Bar and Jack for screwing and unscrewing the Drills so they cannot come loose in the hole. With this you can screw the tools four times tighter than can be done the old way. 1 Patent Sand Pump, Rope and Jar, 1 Heavy Iron Drill Rod and Sinker Bar with the Jars, so as to strike the tools loose if they should stick; Rope Clamp to turn the Rope; Sledge, 2-foot Rule, 1 Monkey Wrench, 1 Tool Box with a good Lock. Price, $475.00.

Notice. We will get up Tools of any size for any depth for pole or rope and shall be pleased to quote special prices.

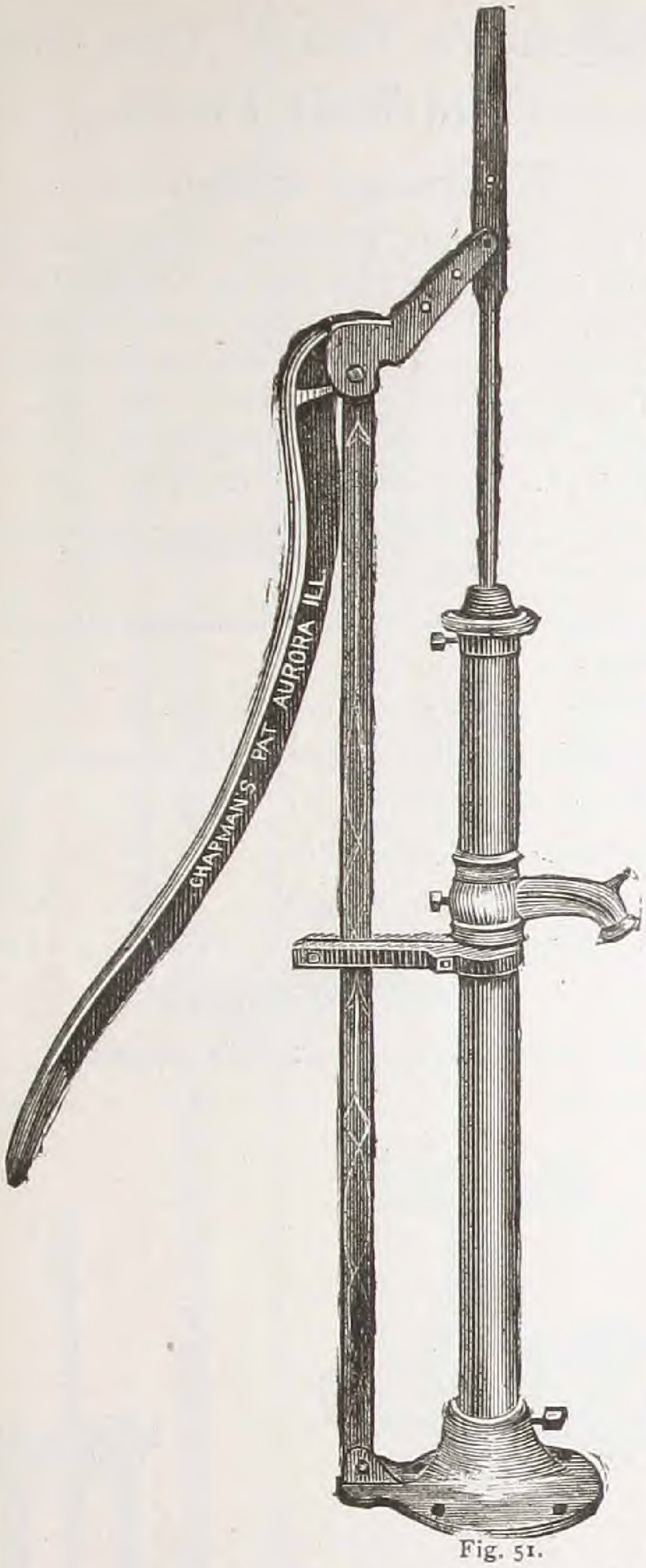


Fig. 51.

Wrought Iron Tube Well Pump.

CHAPMAN'S PATENT.

FOR WIND MILL OR HAND USE.

Adjustable stroke, which can be adjusted from six to twelve inches by moving the pin in the handle. It is made of a superior quality of lap weld tube and wrought iron where strength is required. The handle bearer is nearly four feet in length and swings from the base upwards, carrying the rod perpendicular. It saves twenty per cent. in labor, and was specially designed for our deep tube wells.

Our facilities enable us to compete in price with cheap cast iron pumps, when quality is considered.

We have the following advantages over other pumps:

First—No rust.
Second—Greater strength.
Third—Less friction and easiest worked.
Fourth—Simplest and best.
Fifth—Labor saved.

Price for Pump Stands.

Diameter--	2	2½	3	4
Iron Pipe--	$ 9 (gab)	$10 (gad)	$12 (gag)	$20 (gale)
Galvanized	10 (gat)	12 (gas)	14 (gav)	22 (gay)

Price for Force Pump Stands.

Wr'ght Iron	$12 (gaf)	$14 (gam)	$16 (gan)	$25 (gap)
Gal. "	14 (gar)	16 (gat)	19 (gax)	28 (gaz)

FLOAT VALVES.

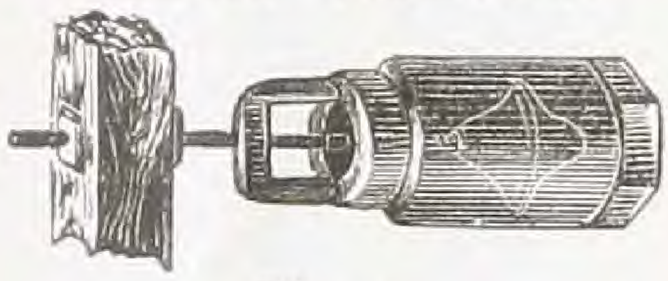


Fig. 55.

Outlet, Inlet, or Float Valves, with Rubber Seat, each: 1 inch, $1.25; 1¼ inch, $1.50; 1½ inch, $1.75; 2 inches, $2.00; 2½ inches, $2.50; 3 inches, $3.00; 3½ inches, $3.50; 4 inches, $4.00. Warranted to always stop the wind mill, and not run the tank over at any elevation.

Price of Fig. 51 Pump Head, Valves, etc., complete.

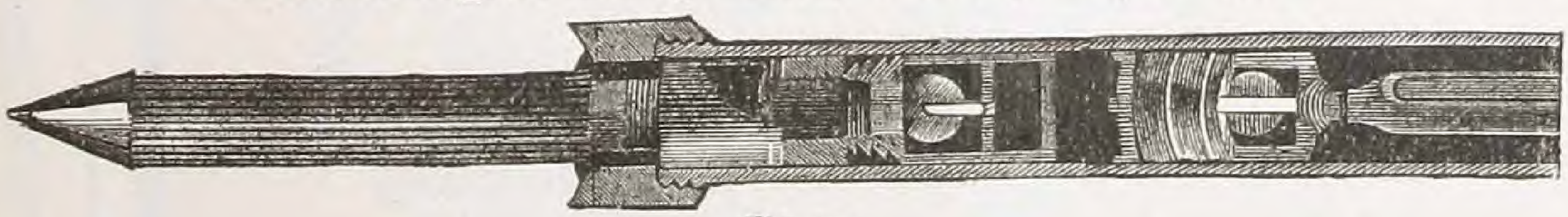


Fig. 99.

List of Articles Required to Pump a Chapman Well.

2-inch Pump Head, Fig. 51	$9.00
2-inch Valves, per set	6.00
Chapman's Malleable Screen	2.00
Reducer Coupling	.50
Total (genet)	$20.50
2-inch Pipe, with wooden rods, complete, per foot	.53

If well is over say 40 feet add $6.00 for a wrought iron brass-lined cylinder; if for a tubular well, add $8.00 for smooth bored wrought iron steel ended cylinder 4 feet long.

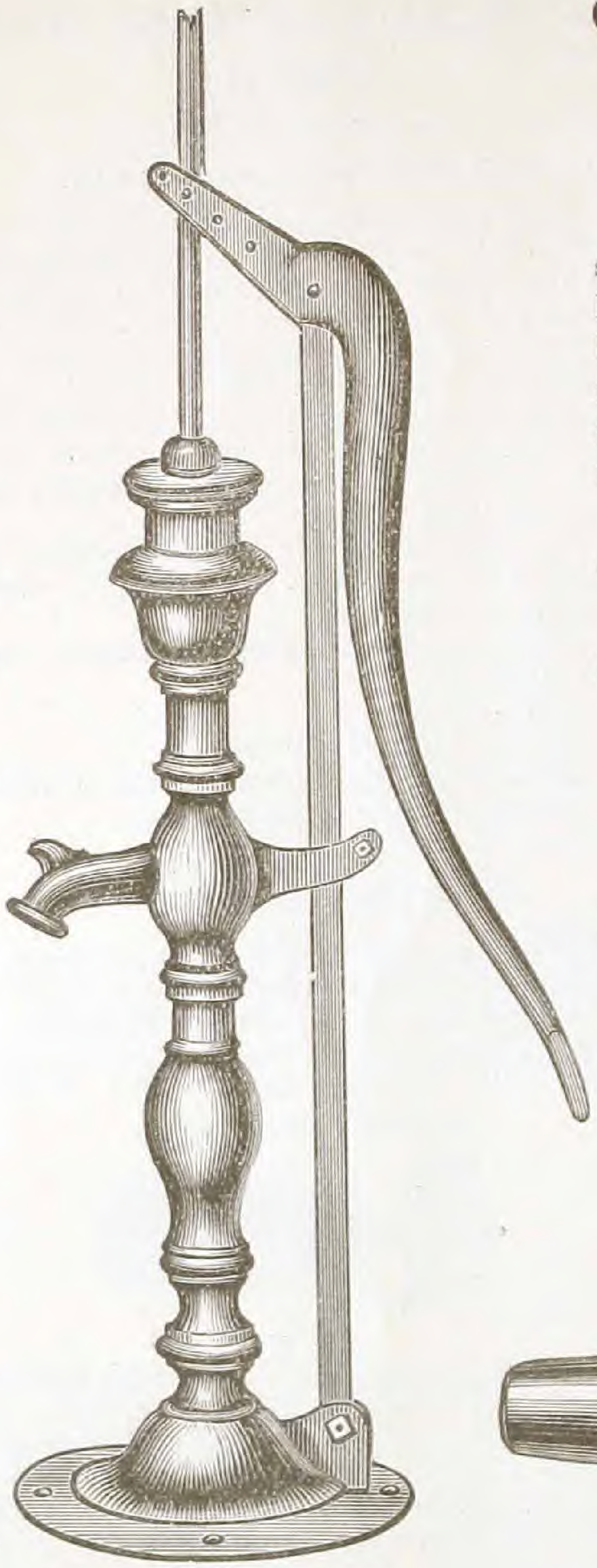


Fig. 100.

Chapman's Patent Cast Iron Tube Well Pump.

FOR WIND MILL OR HAND USE.

Adjustable stroke, which can be adjusted from six to twelve inches by moving the pin in the handle. The handle bearer is nearly four feet in length and swings from the base up, carrying the rod perpendicular. Saves twenty per cent. in friction, and was specially designed for our deep tube wells. It screws on near the spout.

Our facilities enable us to compete in price with cheap cast iron pumps.

We have the following advantages over other pumps:

First—Greater strength.

Second—Less friction and easiest worked.

Third—Labor saved.

Fourth—Most ornamental.

Price, for 2-inch Pump (gill) ----------$11.00
Force Stand (gin) ---------- 14.00

VENT COCKS.

Vent Cock and Tee, for 2-inch pipe and screw thread, (emit) ----------$2.50

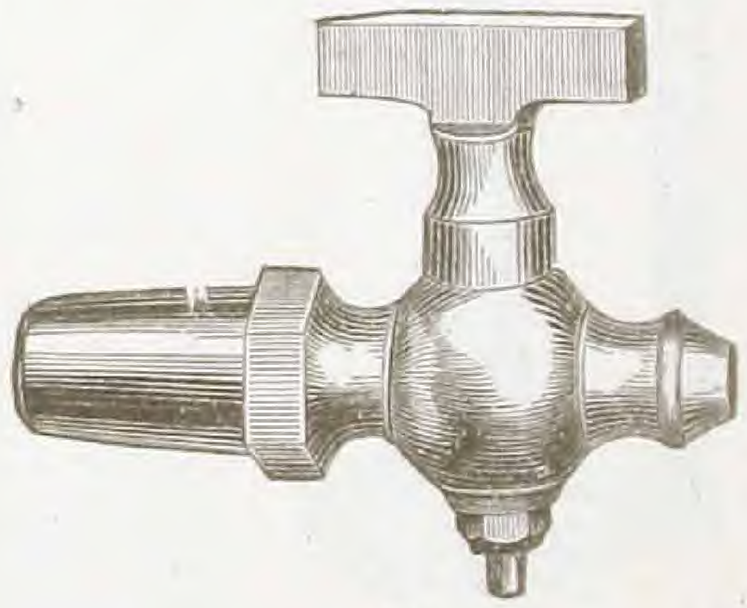


Fig. 50.

WIND MILL PUMP.

This pump-bottom, base and wind mill attachment is a very handy device for wind mill use, and is fitted for two-inch pipe or less, and adapted to force the water under ground. Its delivery being four feet below the surface, prevents its freezing. It has a brass packing box and a polished steel piston rod. When used for the Chapman Tubular Well, the bushing unscrews and admits of the plunger being packed without moving the pump.

Price, for 1 inch delivery (grob)----------$ 8.00
" 1¼ " " (glib) ---------- 9.00
" 1½ " " (globe)---------- 10 00
" 2 " " (glide) ---------- 12.00
" 2½ " " (give)---------- 14.00

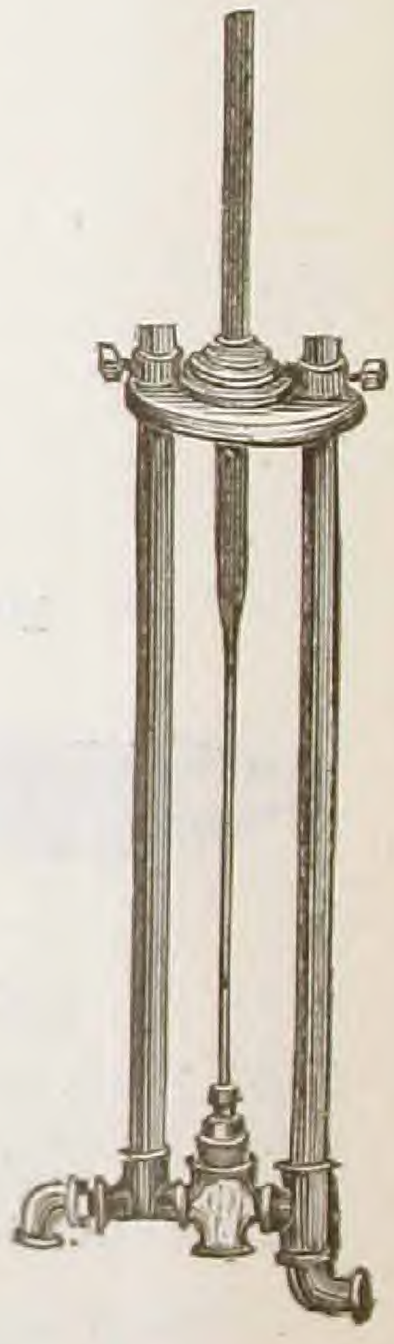


Fig. 101.

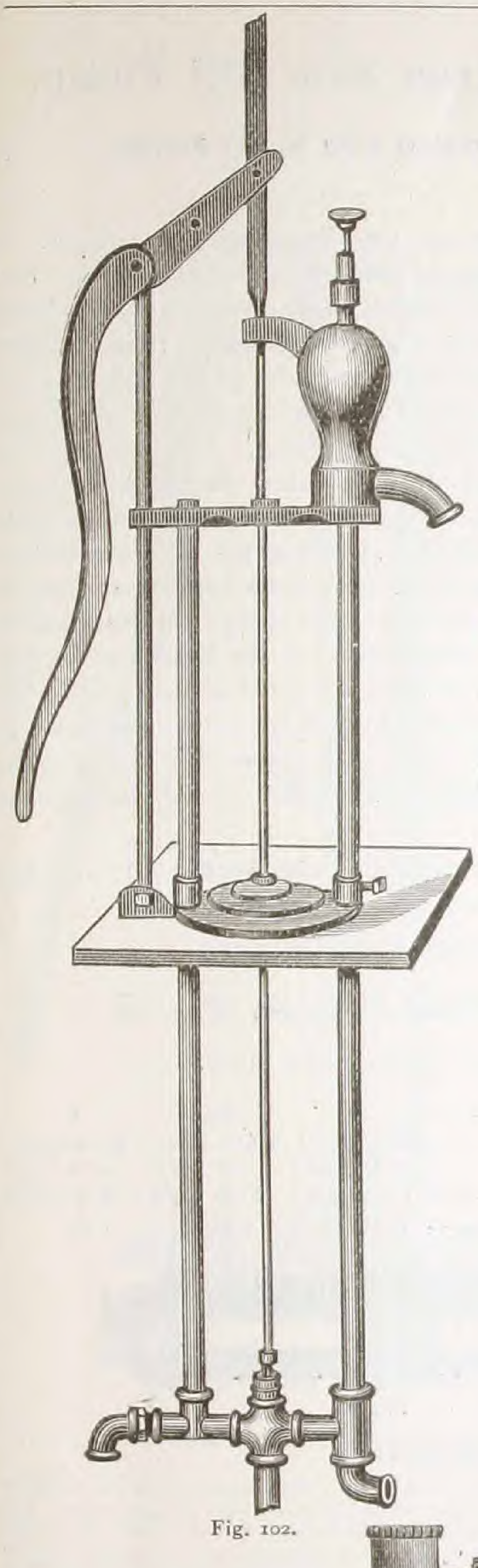


Fig. 102.

Wrought Iron Force Pump.

Chapman's Patent Three-Way Hydraulic Force Pump Head.

FOR WIND MILL OR HAND USE.

This cut shows our new Anti-Freezing Wind Mill Force Pump, with a three-way ball cock. The sectional cut shows the ball. It has two rubber seats. By pulling up the small knob, the ball seats itself in the pipe like a cork in a bottle, and prevents the water from coming up; by pushing down, it prevents the water going down. Its air chamber is 6 feet, of 1¼ inch wrought iron galvanized pipe, and extends 4 feet below the surface. It has a brass or steel rod and brass stuffing box. By removing the stuffing-box, the valves can be withdrawn for repairs without taking off the pump. When desired, a safety valve will be furnished, which stops the wind wheel when the tank is full. This is done by a float-valve, which causes the water to pour into a keg which is attached to the shut-off gear, and when full, drops down, throwing the wheel out of gear. A small hole is in the keg and the water slowly leaks out, and when empty, it rises and starts the wheel again.

All joints have a gas-pipe thread, and any plumber can supply any part. There is no cast iron to rust the water, and it is the most perfect pump ever designed for the trade. The enlarged section cut in the figure shows how the three-way anti-freezing ball cock is applied.

The artist has made this cut out of proportion, and we guarantee it to be a very pretty design.

ANTI-FREEZING PUMPS.

Fig. 103 illustrates the mechanism of a part of our anti-freezing pumps. The ball represented in the cut is connected to the top of the pump by a small iron rod and acts as a cork to a bottle, so that the water can be raised to the surface, or throwu out at pleasure, by raising or lowering the ball.

We make all styles of this pump double acting.

Fig. 103.

PRICE OF PUMP HEADS.

Size of pipe, inches	2	2½	3
Style A, without cock	$12.00 (gore)	$14.00 (gate)	$16.00 (grit)
Style B, with cock	14.00 (goat)	16.00 (grey)	18.00 (glove)
Style C, with cock and safety valve	17.00 (goal)	20.00 (grill)	22.00 (grip)
Double action, add	3.00	4.00	5.00

The hydrant part of this pump, with five feet of 1 inch pipe, and nozzle, $4.00; 2 inch pipe, or less, $6.00.

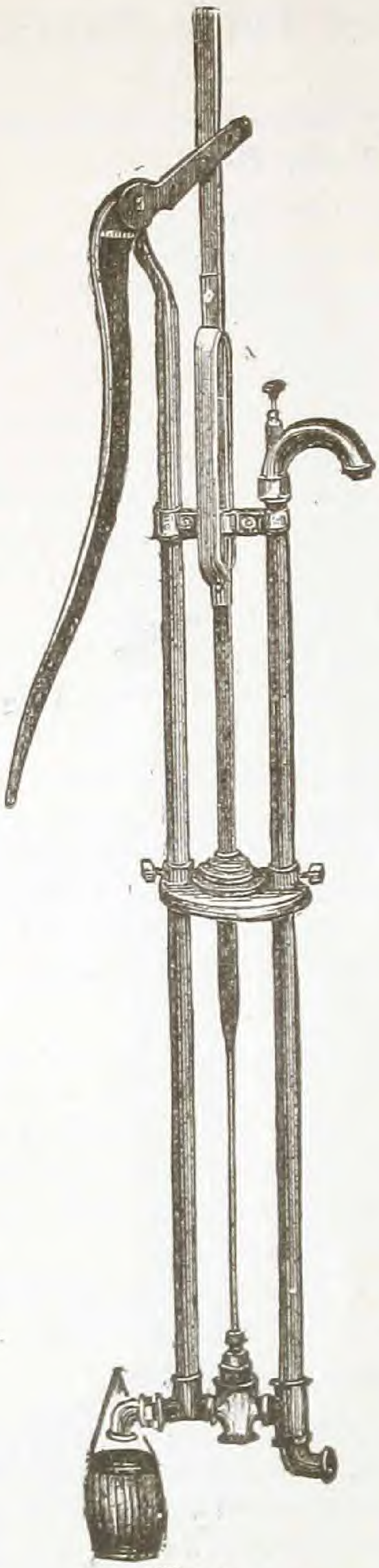


Fig. 54.

Wrought Iron Saw Mill Pump.

ROTARY POWER AND HAND PUMPS.

This cut illustrates our new improved Pump Stand. It extends four feet below the platform, and is frictionless. Has no top guide. Can be used for rotary power, or hand or horse power, as the power attachment can vibrate. It is provided with an approved safety valve, which stops the mill, etc., and has three strokes and a steel or brass piston rod. Is nearly all wrought iron—handsome and strong. A cylinder can be located at any desired distance below the working head. But with this, as with all the Chapman patent pumps, their adaptation to deep wells and repairing has been a consideration and provided for by an extra large bushing or plug at the stuffing box, and can be removed to take out the plunger, etc. This is quite a consideration to the purchaser, saving at least one dollar each time the packing wears out. We have designed a large number of pumps, but we are frank to say this one combines more good points than any of them, and we cannot see where it is possible to add the slightest improvement.

The hydrant part of this pump, with five feet of 1 inch pipe, and nozzle, $4.00; 2 inch pipe, or less, $6.00.

We make all styles of this pump double acting.

Price of Pump Fixtures.—Fig. 54.

1¼ and 1½ inch same as 2 inch.

Size of pipe in inches	2	2½	3
Style A, wihout cock	$12 00 (had)	$14 00 (hall)	$16 00 (hill)
Style B, with cock	14 00 (haft)	16 00 (hall)	18 00 (hie)
Style C, with cock and s. valve	17 00 (hail)	20 00 (halk)	22 00 (hind,
Double acting, add	3 00	4 00	5 00

Fig. 56.

IRON PUMP CYLINDERS.

No. 1, 2½ x 9,	for 1 inch pipe	(groin)	$3.00
No. 2, 2½ x 9,	for 1¼ "	(grog)	3.50
No. 3, 2¾ x 9,	for 1¼ "	(groom)	3.75
No. 4, 3 x 9,	for 1¼ "	(gross)	4.00
No. 5, 3¼ x 9,	for 1¼ "	(grope)	4.25
No. 6, 3½ x 9½,	for 1½ "	(groat)	4.56
No, 7, 3¾ x 10,	for 1½ "	(grant)	5.50
No. 8, 4 x 10,	for 1½ "	(grot)	6.50

Rule for Getting the Capacity of Pump, and Power Required.

We lay down the following for calculating the capacity of any Piston Pump: Multiply the area of bore of cylinder of pump, by the length of stroke, and that result by the number of strokes per minute the pump is working. This gives the quantity of water in cubic inches. Divide this by 231, number of cubic inches in a gallon, and you have the total capacity of pump per minute, in gallons and fractions of a gallon. And to ascertain the power required, multiply number of gallons per minute by 8.35, weight of one gallon, and this result by total number of feet water is raised, (that is, from surface of the water to the highest point to which the water is raised,) and you have the power in foot pounds Divide by 33,000 and you have the horse power. One horse power is equal to about five men. To the theoretical power a liberal allowance for friction, etc., always wants to be added. It is better to get double the power required.

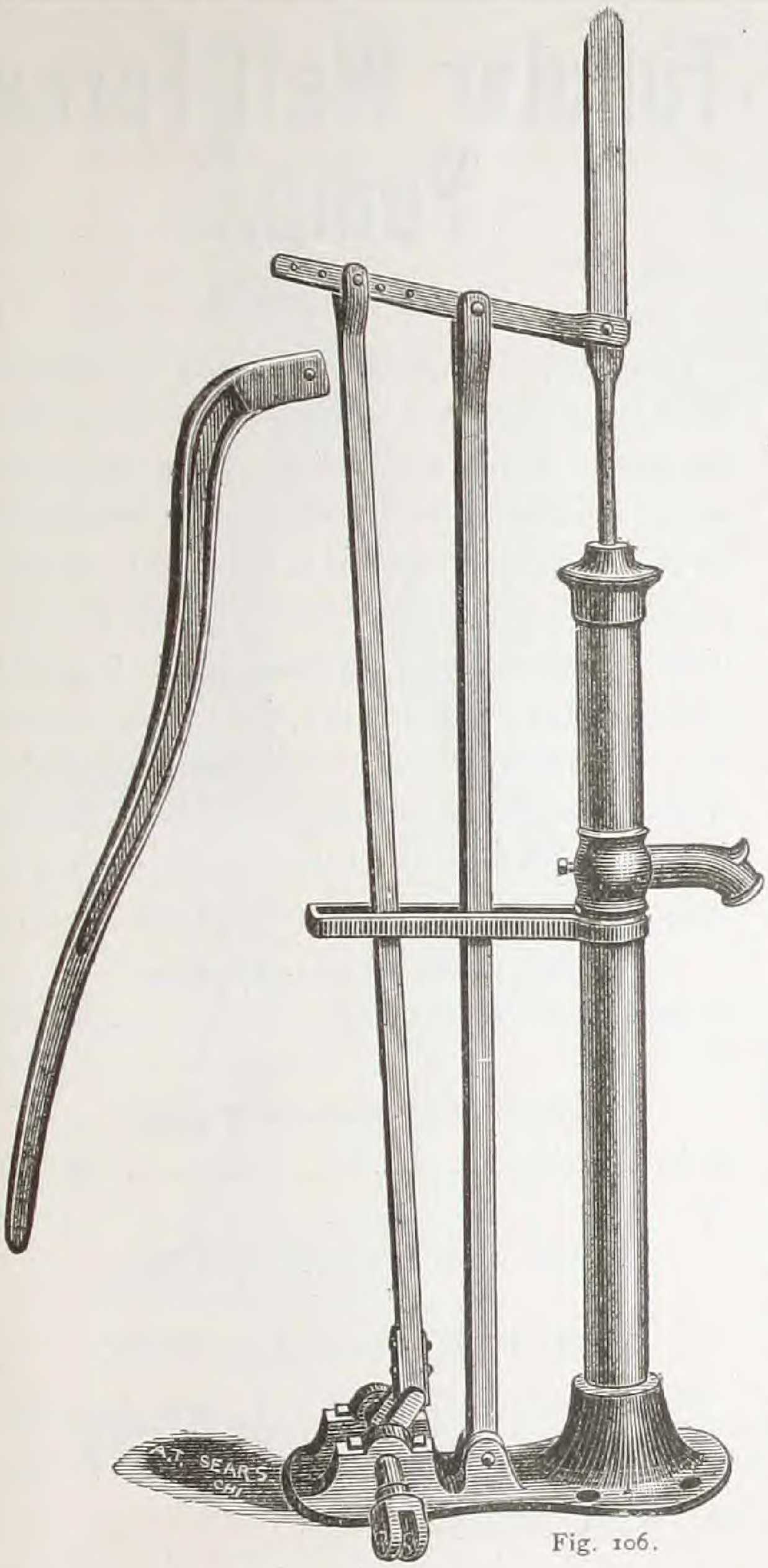


Fig. 106.

STUFFING BOXES.

For 2 in., or less, (age)	$ 4.00
2½ in. (after)	5.00
3 in. (beauty)	7.00
4 in. (still)	12.00

Fig. 52.

BRACKET STUFFING BOXES.

No. 1, for 1 inch pipe (hit)	$2.00
No. 2, for 1¼ and 1½ inch pipe (hin)	3.00

Hose Clevis, either plain or to atttach hose with Clamp, or threaded to receive a ¾ or 1 inch hose coupling ---------- 50 cents.


Fig. 17.

Wrought Iron Horse Power, Dairy, and Stock Pump.

Fig. 106 illustrates an entirely new arrangement for a hand horse-power and wind mill pump. The handle is adjustable, as represented in the cut. When this pump is used by wind mill power, the hand and horse power are disconnected. When it is desired to use the horse power, detach the wind mill and simply connect the tumbling rod with the knuckle on the base of the pump; this rotates the crank, giving the desired movement to the plunger.

Attention, Dairy and Stock Men.

This pump meets a long felt want as a reliable pump for dairy purposes and stock use, also railroad and fire purposes. It is always ready to be staked to the ground, so there is no expense in setting up, and is the cheapest and most durable pump now in use.

Price for Horse Power and Pump, all complete to attach to any pump pipe not larger than 2 in. (hoop) $55.00

Price for Pump Stands only.

For 2 inch well, or less			(hook)	$20.00
For 2½	"	"	(hop)	26.00
For 3	"	"	(hood)	32.00
For 4	"	"	(hour)	50.00

To make a force pump like Fig. 102 with this attachment:

For 2 inch well, or less			(hog)	$24.00
For 2½	"	"	(hug)	42.00
For 3	"	"	(hung)	40.00
For 4	"	"	(hurl)	60 00

(See Horse Powers for prices.)

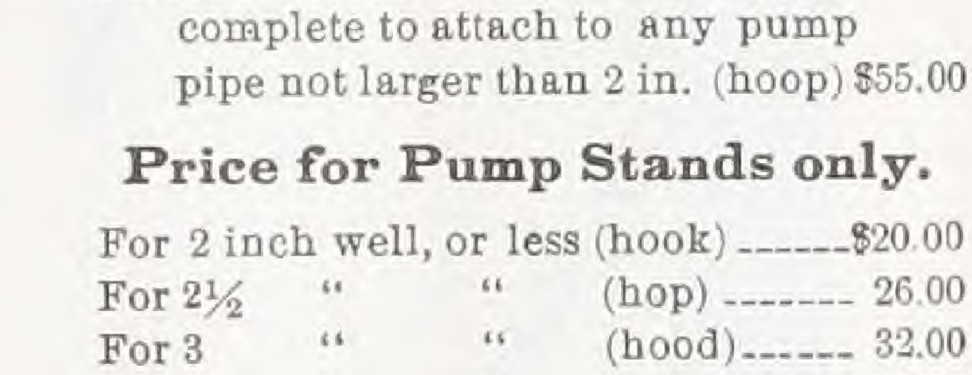


Fig. 16.

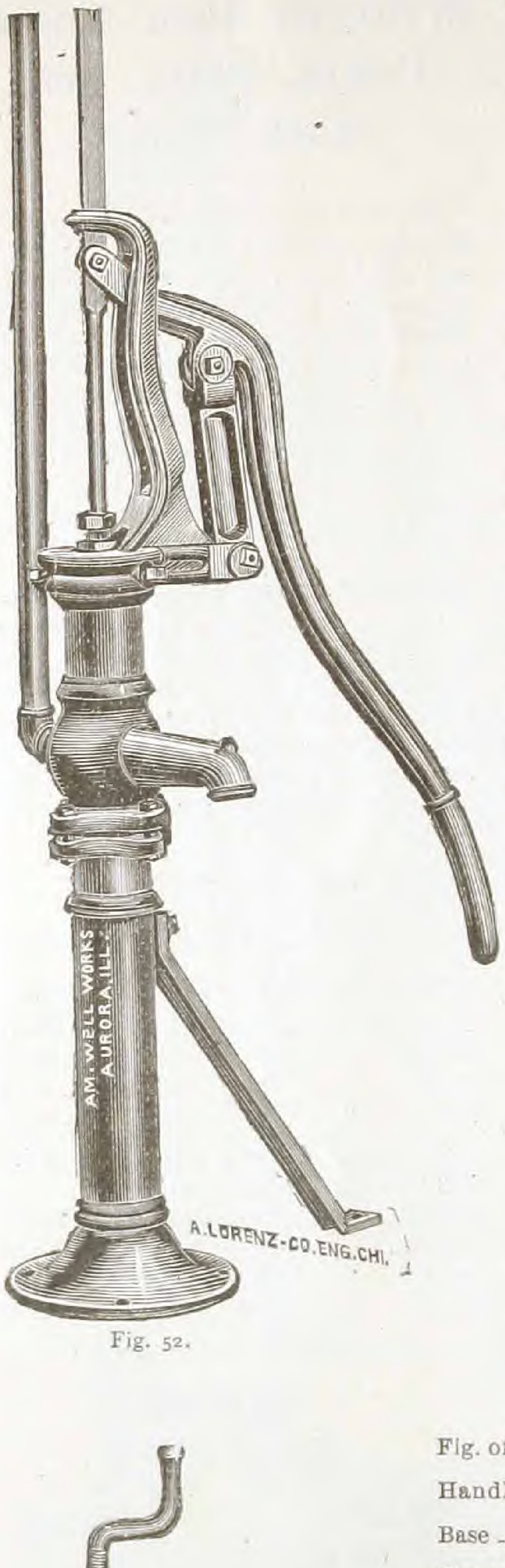


Fig. 52.

Tubular Well Force Pump.

This pump is especially designed for tubular wells in cold countries, as the pipe screws in near the spout. It bolts together just below the spout, so that the tubular well valves can be withdrawn for repairs without unscrewing the pump. It also has an outlet to force the water and to fill elevated tanks. In that case an adjustable nozzle is placed over the spout to prevent the water from running out. It is made of cast iron and tapped for $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$ or 3 inch pipe, and suitable for wells from 50 to 300 feet. It has a 6 or 10 inch stroke, and is also made without the force pump connections.

Prices for Force Pumps.

10 inch Stroke Force Pump	$14.00
6 " " " "	13.00

Fitted as a Common Pump.

10 inch Stroke	$12.00
6 " "	11.00

Add $1 when fitted for 3 inch pipe.

PIPE PUMP REPAIR VISE.

This will hold from $\frac{1}{4}$ inch to $1\frac{1}{2}$ inch pipe, and also the small sucker rod. It a handy tool to bolt on a wagon. Price, net, $3.50.

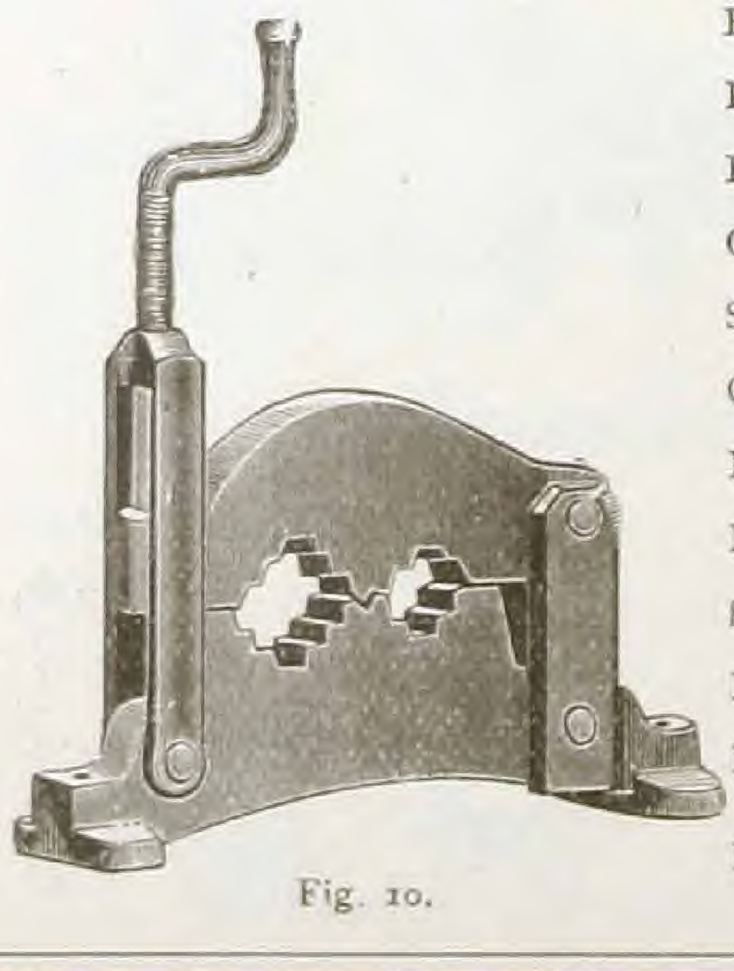


Fig. 10.

PUMP REPAIRS.

Fig. of Pumps	51	53	54	100	101	102	106
Handle	$2 00	$2 00	$2 00	$2 00	$2 00	$2 00	$2 00
Base	2 00	4 00	2 00	2 00	2 00	2 00	4 00
Clamps	1 50	1 50	1 50	1 50	1 50	1 50	1 50
Spout	2 00	3 00	2 50	----	----	4 00	2 00
Cap	1 00	3 00	50	1 50	50	1 50	1 00
Fulcrum Rod	1 50	1 00	2 50	1 50	----	1 50	2 00
Piston Rod	2 00	2 00	50	2 00	2 50	3 00	2 00
Standard	1 50	----	----	8 00	----	----	2 50
Discharge Pipe	----	----	1 50	----	----	2 50	----
Piston Vibrating Connecting Rod	----	----	1 50	----	----	----	3 50
Power Crank	----	----	----	----	----	----	10 00

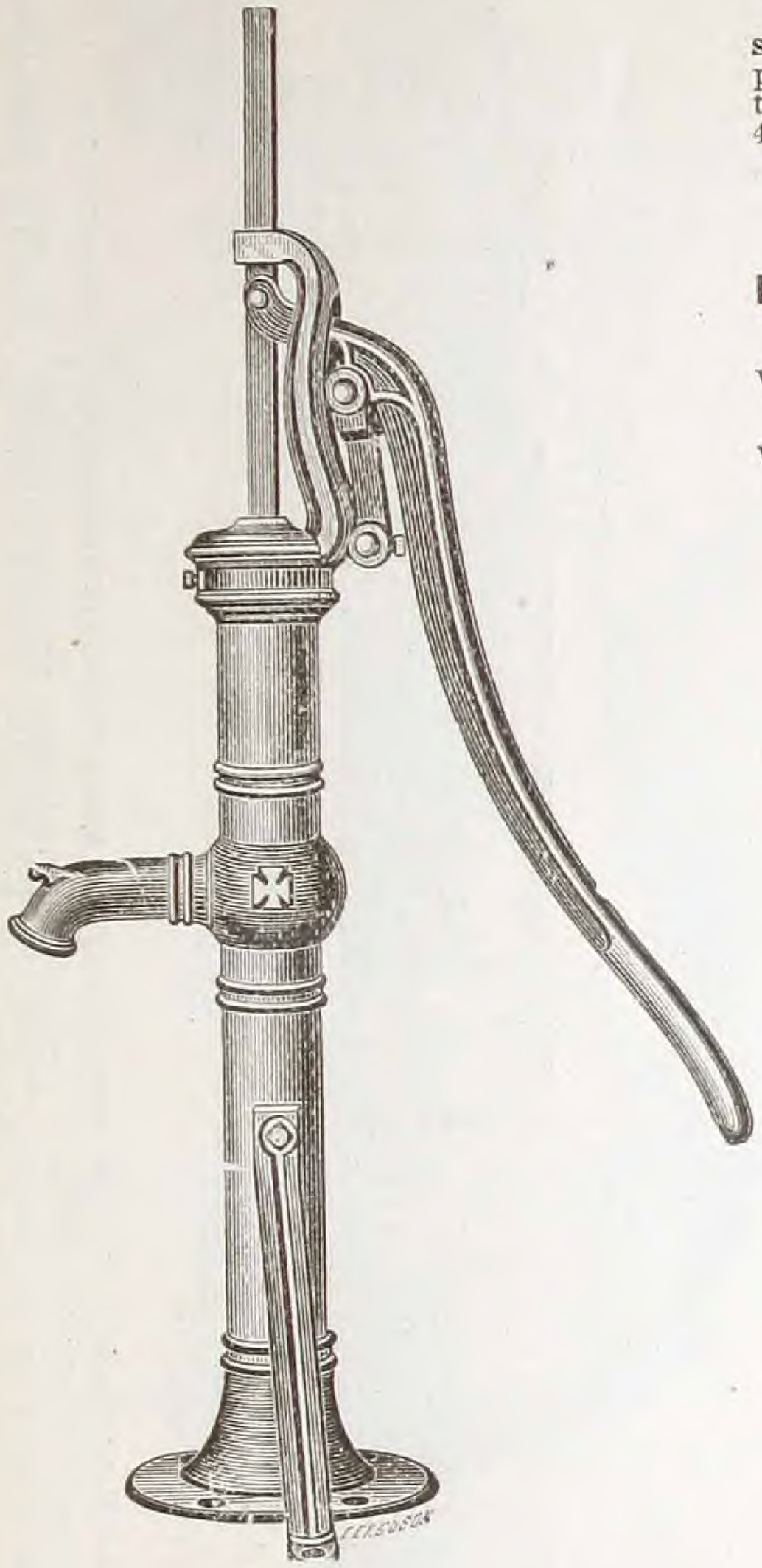


Fig. 57.

Fig. 57 is a cheap Wind Mill Pump, cast iron, pipe screws in near the spout and is tapped for 1¼ inch pipe It is finished in first-class shape, and is equal to any cast iron pump in the market; suitable for 40-foot well.

No. 3, with brace	$7 00
No. 4, " "	8 50
No. 5, " "	9 50

Price of Pump, Complete, for 20-foot Well.

Pump Head, $7.00; 2¼ inch Cylinder, $3.00; Galvanized Pipe, $5.60; Rod and Fitting, $1.15—$16.75.

This is the cheapest anti-freezing pump, complete, we have. Discount to the trade.

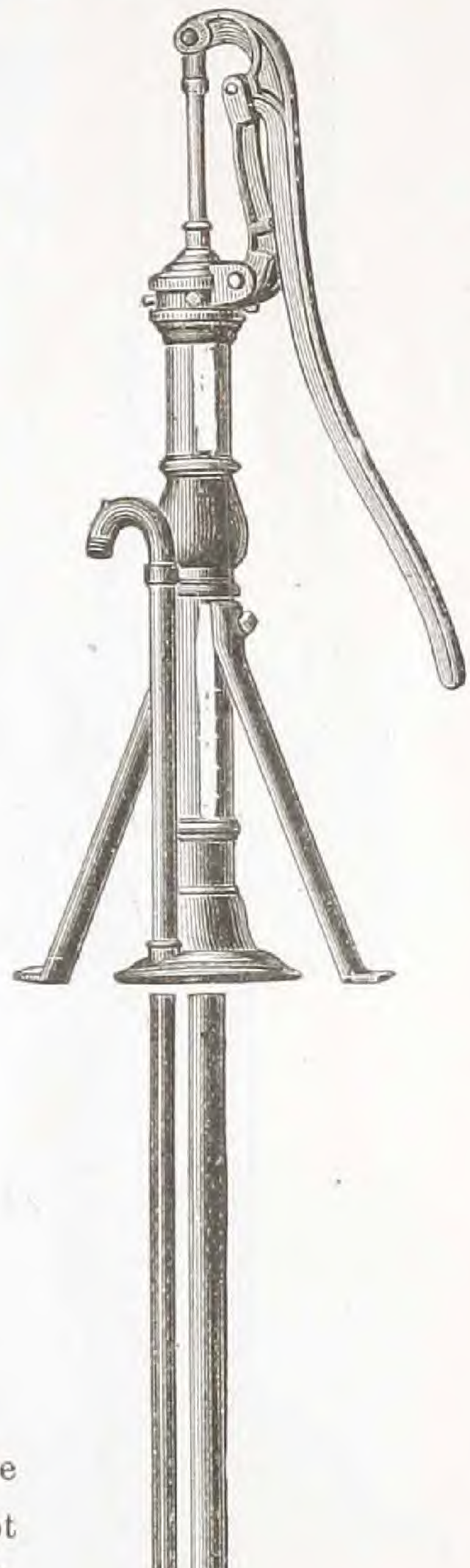


Fig. 15.

NEW DOUBLE ACTING FORCE PUMP.

ANTI-FREEZING.

Fig. 15 represents a new, double acting force pump. The cylinders are below the frost. This style is adapted to wells not over thirty feet deep. It is strongly built and thoroughly efficient, and very simple in its construction. Where a very powerful Fire Engine Pump is wanted an air chamber is put on at the goose neck, which adds to its efficiency. No. 1 has one brace, Nos. 2 and 3 two braces.

	Iron Cylinder.	Brass.
No. 1, 3 inch cylinder	$15 00	$18 50
No. 2, 3¼ inch cylinder	16 00	20 00
No. 3, 3½ inch cylinder	17 00	21 50

Air Chambers 75 cents extra.

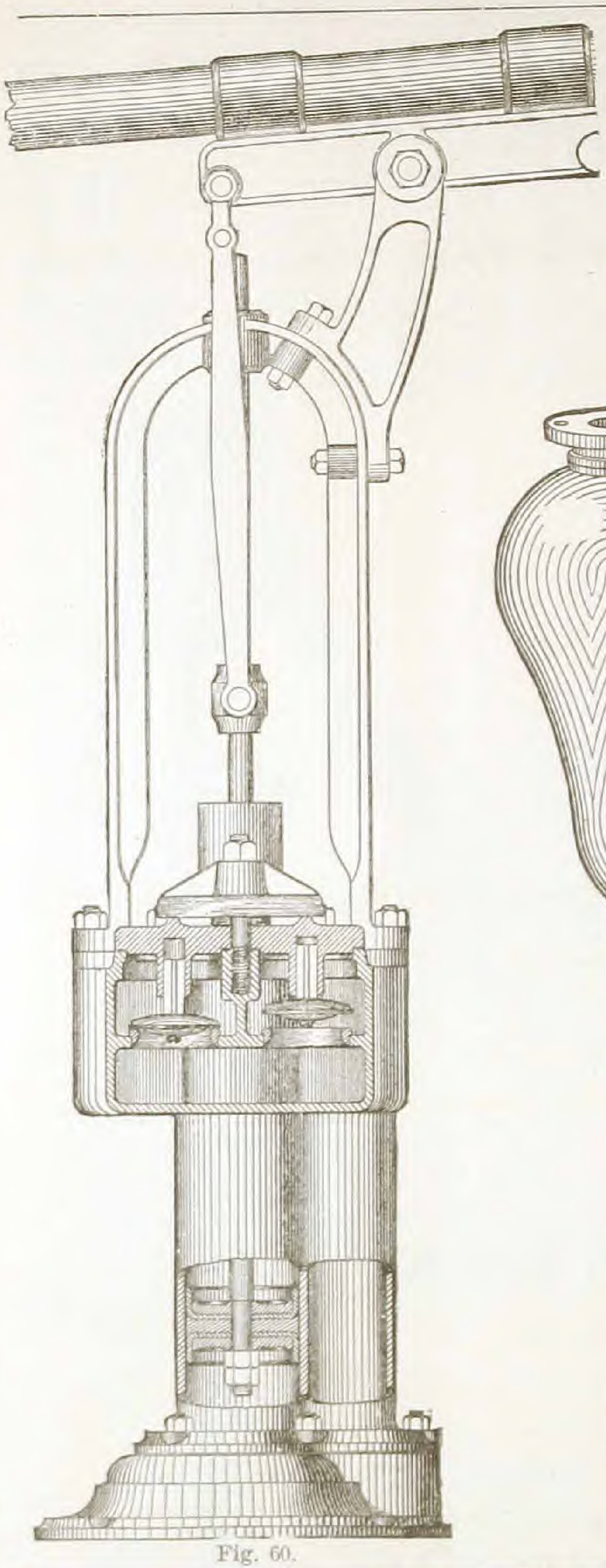


Fig. 60.

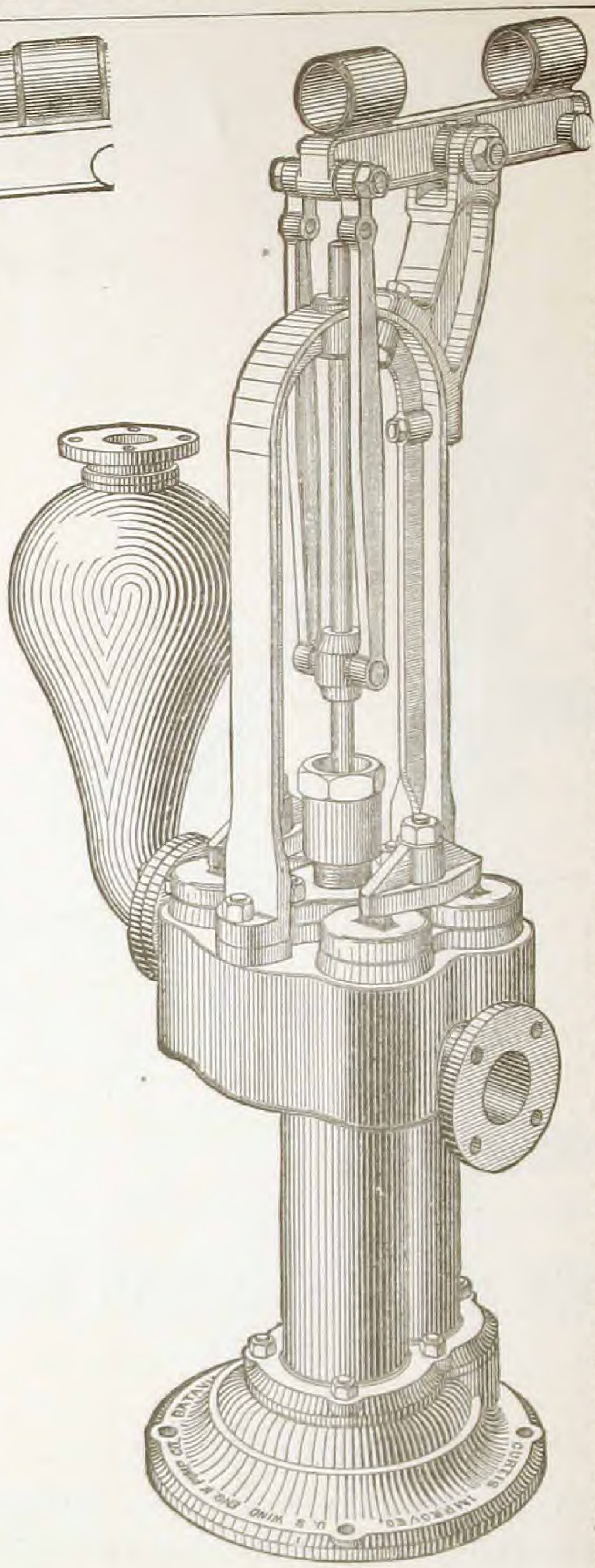


Fig. 61.

Improved Curtis' Double-Acting Railroad Pumps.

We guarantee this pump to throw more water and work easier than any other pump in the market. The water passages are large. The Valve Seats, Valve Stems and Stuffing Boxes are made of brass, and the Valves and Plunger are easy to get at and to repair.

Description.	Calibre of the Pump Cylinder in Inches.	Length of Stroke in Inches.	No. Strokes per Minute Two Strokes per Revolution.	Water Discharged per Minute in Gallons.	Size of Suction Pipe in Inches.	Size of Discharge Pipe in Inches.	Diameter of Suction Pipe Flange in Inches.	Diameter of Discharge Pipe Flange in Inches.	Price, Iron Cylinder.	Price, Brass Lined Cylinders.
Prices given are for Hand and Power Pumps, with air chamber on the discharge. Supply Air Chambers extra.	3	12	120	45	1¼	1½	5	5	$45 00	$50 00
	3	15	110	50	1½	1½	5	5	50 00	55 00
	4	12	100	66	2	2	5¾	5¾	60 00	67 00
	4	18	90	88	2½	2	5¾	5¾	70 00	77 00
	5	12	90	90	3	3	7	7	75 00	85 00
	5	15	88	111	3	3	7	7	80 00	90 00
	5	18	86	135	3	3	7	7	90 00	100 00
	6	15	86	157	4	4	8½	8½	115 00	130 00
	6	20	80	185	4	4	8½	8½	125 00	140 00

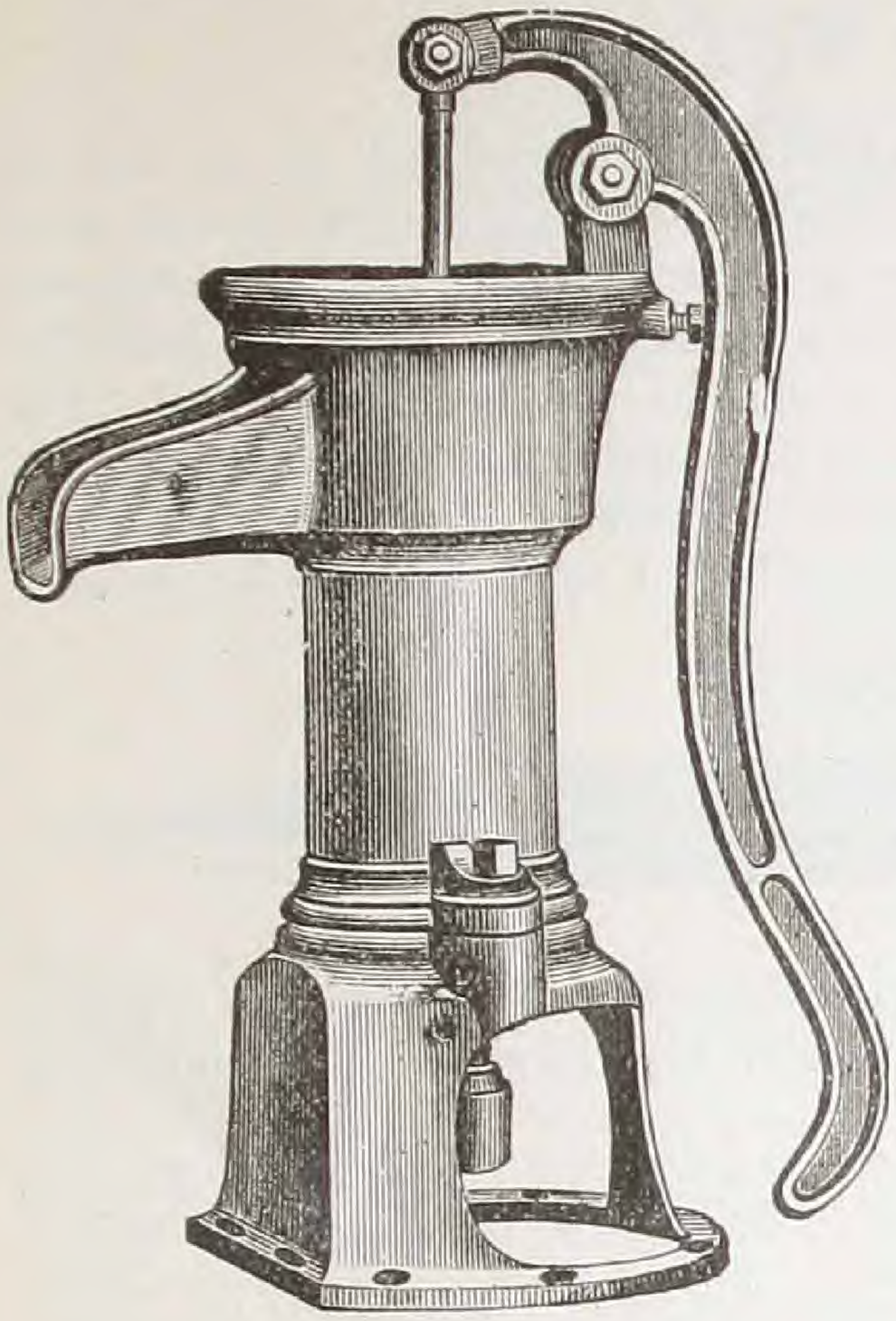


Fig. 59.

Pitcher Spout Pump.

CLOSED OR OPEN TOP, AS ORDERED.

It is a Cistern Pump, and can be used with either iron or lead pipe. It is also suited to shallow wells.

No. 1, 2½	inches	for pipe 1	inches	-------	$4 25
" 2, 2	"	"	1¼	" -------	4 75
" 3, 3½	"	"	1¼	" -------	5 25
" 4, 4	"	"	1¼	" -------	5 75
" 5, 4½	"	"	1½	" -------	6 25

The cylinder of this pump is polished very smooth.

RAILWAY HORSE POWER AND PUMPING ATTACHMENT.

FOR PUMPING AT RAILWAY WATER STATIONS.

Suitable for all purposes where a Horse Power can be used, and is made in a Thorough and Workmanlike Manner.

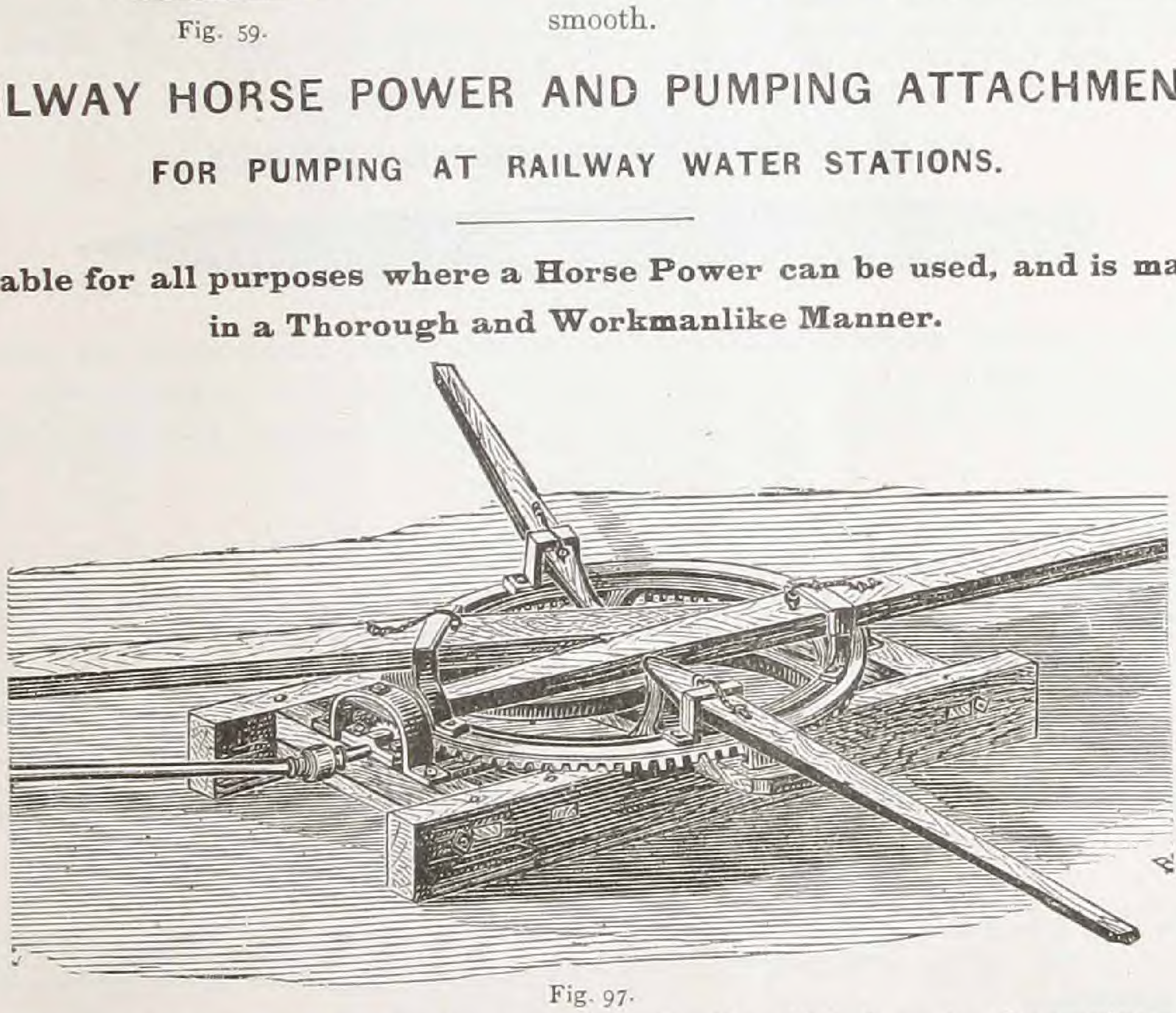


Fig. 97.

When used for pumping, a crank plate is used. (See Fig. 5, parts of pumping wind mill.) It should also have a balance wheel in proportion to the size of the pump. Each power has 12 feet of tumbling rods and two couplings. The pump attachments consist of a 4-foot shaft and boxes, 600-pound balance wheel, crank plate, pin and pitman.

Two-Horse Power (only), 12 feet Tumbling Rods ---------- $55.00
Pumping Attachment ---------- 55.00

We keep in stock 1, 2, 4 and 8-Horse Powers of this pattern.

Chapman's Patent Well Screens.

The success of a well depends so much on a properly constructed well screen that we have made one that meets all the requirements. There are many wells that do not yield enough water, and the cause is often that there is not enough capacity, or the sediment settles in the bottom. We have seen well men take a worn-out piece of pipe and drill fifty $\frac{3}{8}$ inch holes in it, and some stormy day take it to a tin shop and have it covered. The trouble is that there are not enough holes and the milk strainer is not suitable, and the consequence is that the wells do not give satisfaction. We make a screen and sell it to you so cheap that we do not expect to make any money off it, but by your doing better work our sales will be larger.

(PATENT APPLIED FOR.)

Fig. 163.

Chapman's Patent Malleable Well Screen has a capacity of 378 $\frac{3}{8}$-inch holes, is 29 inches long of 1-inch pipe size, and has a brass jacket and No. 50 wire gauze. It is especially designed for the Chapman tube wells.

Covered with wire gauze	No. 50.	No. 60.	No. 70.	No. 80.	No. 100.
1 inch Screen	$2 00	$2.50	$2.75	$3.00	$3.50
1¼ inch Screen	2.25	2.75	3.00	3.25	3.75

For Galvanized add 10 per cent. to net price.

2-inch Screen, 36 inches long, covered with perforated brass and 50 mesh wire gauze, 1000 $\frac{3}{8}$ inch hole capacity, each, (coilerty), $8.00.

All other sized screens will be made to order.

CHAPMAN'S SELF-CLEARING SCREENS.

Fig. 13.

This screen, by a simple mechanical device, clears itself of all sediment by the action of the water through it, and prevents its filling up. For drive wells or Chapman's wells.

1¼ inch, for 2 inch well, each (cad)	$8.00	2 inch, for 3½ inch well, each (cape)	$25.00
1¼ " 2½ " " (cat)	9.00	2 " 4 " " (cane)	35 00
2 " 3 " " (cam)	15.00	2½ " 6 " " (cite)	45 00

CHAPMAN'S SELF-SEATING SCREENS.

This screen is to be used where the gravel rises up the pipe, and is seated without driving the screen or drawing back the tubing. Seating apparatus $10 with instructions.

1¼ inch, for 2 inch wells (coil)	$ 9.00	2 inch, for 3 inch wells (cave)	$16.00
1½ " 2½ " (cord)	10.00	2½ " 4 " (corn)	45.00
4 inch, for 6 inch wells (choice)	$75.00		

MORRILL'S PATENT SCREEN FOR CHAPMAN'S PATENT WELL.

Fig. 38.

Strainer for 2 inch well [crib]	$7.00	Strainer for 3 inch well [city]	$12.00
" 3½ " [cab]	8.00	" 4 " [coin]	35.00

Fig. 176.

☞State, in ordering, whether these screens are wanted for a drive well or for the Chapman well. When all other screens stop up, send for the Morrill.

FOOT VALVES.

WITH STRAINERS.

Size	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price, each,	1.50	1.75	2.50	3.25	4.25	5.00	6.50	8.00	10.00	12.00	17.00

CHAPMAN'S PLUNGER VALVES.

Fig. 43.

CHAPMAN'S BRASS SEAT CHECK VALVES.

Figs. 43 and 48 constitute a set.

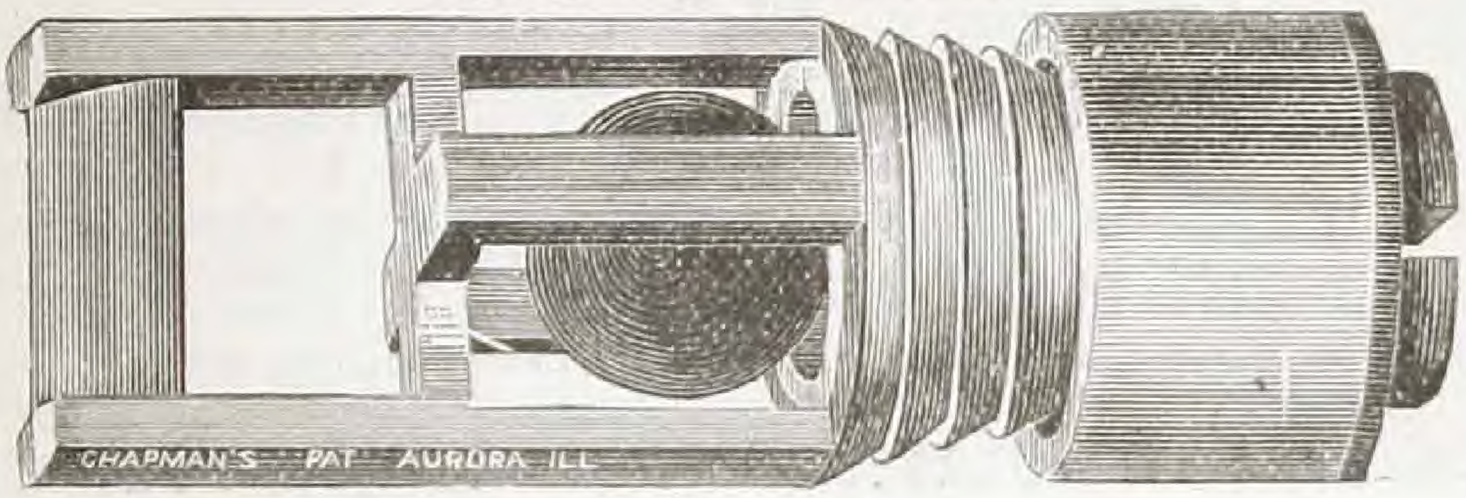


Fig. 48.

Fig. 48 is the result of our experience as the best check valve we ever made. This is seated by pushing down, and the grooves hold the packing from slipping. It is easily removed by pulling up, and the loose ring holds the packing on. A leather ring might be used in quicksand wells when it is put in without packing around the screen. When the ball is worn out, it is held in the valve by a projection in the tube or water passage close below the seat.

Size, inches	2	2¼	3	4	5	6
Check and Plunger, per set	$6[filter]	$8[font]	$12[foot	$30[footing]	$50[fanny]	$72[fickle]

CHAPMAN'S RUBBER SEAT CHECK VALVES.

Fig. 37.

There is a small ring of rubber under the ball, which is held in a groove.

Size, inches	2	2½	3	4	5	6
Brass Seat Check Valves	3.00 (fan)	4.50 (fun)	6.00 (film)	15.00 (from)	25.00 (fancy)	36.00 (farm)
Rubber Seat Check Valves	3.50 (friend)	5.50 (fount)	7.50 (fisk)	18.00 (frame)		40.00 (fide)

TAKE NOTICE.

We furnish, when ordered, a Clapper Valve, in the check valve, in the place of a ball. It is a very good article, but not as reliable and durable as our Gutta Percha Ball Valve. We also use a brass poppet valve in the plunger, and for very deep wells use an extra packing on the plunger for every 100 feet depth. This valve is made to work 200 feet. For a well that has to lift the water more than 200 feet a double valve should be used. This costs four times the price of our regular valves.

Our Oil Well Pump, Barrel and Valves complete, for 2 inch well, will work in a 1,000 foot well, $35.00.

All illustrated goods are kept in stock. All goods not illustrated are made to order. Cash must accompany the order. We will make anything you order in our line.

VALVE REPAIR LIST.

For Wells, inches	2	2½	3	4	5	6
Plunger Cage	$1 50	$2 25	$3 00	$7 50	$12 50	$18 00
Plunger Bottom	1 00	1 50	2 00	5 00	8 50	12 00
Plunger Ring	25	38	50	1 25	2 00	3 00
Plunger Leather Packing	20	30	40	1 00	1 50	2 40
Plunger Gutta Percha Balls	50	75	1 25	3 00	5 00	8 00
Plunger Coupling	30	45	60	1 50	2 50	3 60
Check Valve Cage	1 50	2 25	3 00	7 50	12 50	18 00
Check Valve Bottom	1 00	1 50	2 00	5 00	8 50	12 00
Check Valve Packing	50	76	1 00	2 50	4 00	6 00
Check Valve Ring	15	25	30	75	1 25	1 80
Check Valve Seat	50	75	1 25	3 00	5 00	8 00

THE CHAPMAN BORED AND POLISHED TUBULAR WELL BOTTOMS.

75 cents furnishes our Improved Valve Grab, so that the Check Valve can be taken out with the Pump Rods. This cannot be done with any other Valve.

Fig. 75.

Fig. 75 is the Chapman Tubular Well Bottom complete. The Pipe is heavy hydraulic tube made of the best of iron and bored out smooth its whole length. To the lower end is welded a homogeneous steel collar turned true, a little larger than the coupling of the pipe, which will cut off the hard substance the Drill does not cut, and the Tube being heavy prevents its being bent in driving.

Price of Figs. 75, 122, 5 and 22 [Screen, Valves and 4-foot Cylinder, complete.]

2 inch	$15 00	3 inch	$25 00
2½-inch	18 75	4-inch	50 00
5-inch	$ 75 00		
6 inch	125 00		

These prices include any style of our screens, finer or coarser, double or single cover. State what pump head you wish to use.

CHAPMAN'S POLISHED TUBE WELL BOTTOMS.

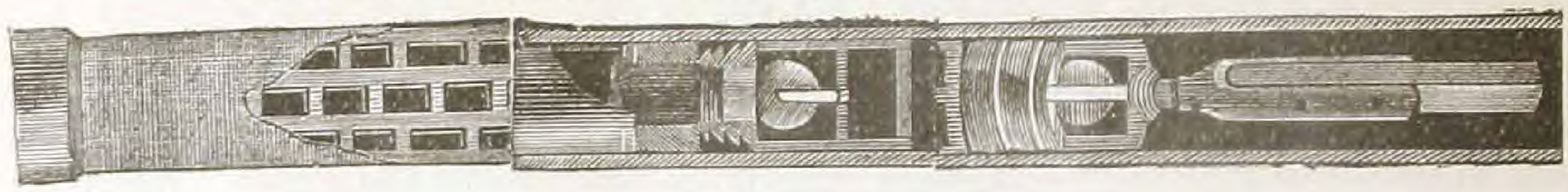


Fig. 122.

Fig. 122 is a Well Bottom bored out smooth, like Fig. 75, but having a Strainer on the bottom so when it is down on to hard substances, in course gravel or rock, the water can come in and the hole is complete, and the screen is seated as soon as the Tube is down. This is a favorite with well men. The price is the same as Fig. 75.

All these inventions are owned by us, and parties infringing will have to pay the damage the courts will allow.

CHAPMAN'S MIDDLE LINE OIL WELL CYLINDER.

This Cylinder is bored smooth, of a superior pipe. It is polished for the sucker to work in, and is used several feet up the pipe and screwed between the pipe. Its use is this: The water rises up hundreds of feet, and it is not necessary to put the sucker down so low, the check goes to the bottom, or is seated above the screen, or in the pipe, as required. A steel shoe, valves and screens included.

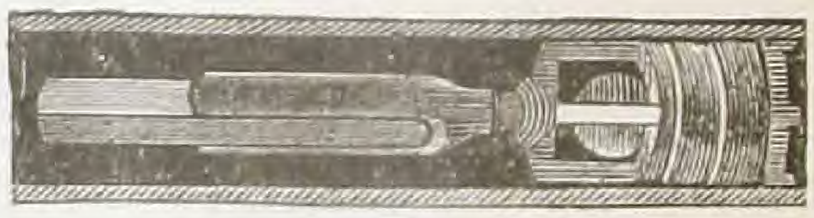


Fig. 5.

SMOOTH BORED OIL WELL BOTTOM.

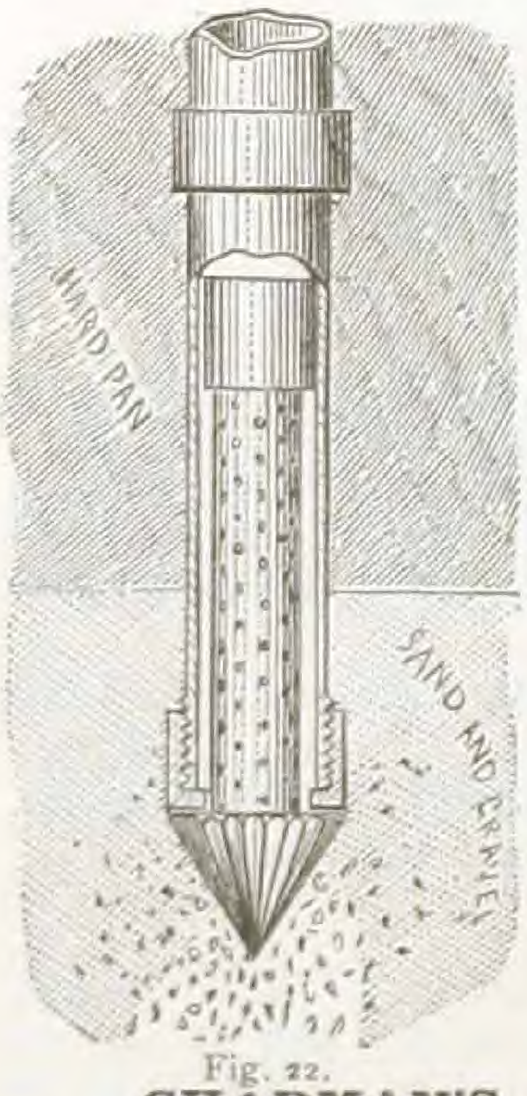


Fig. 22.

Fig. 22 is a well-point, or bottom, 4 feet long, having a screen inside of a well tube. It may be driven down into the sand or gravel in the bottom of the dangerous well, and when deep enough draw the tube back, leaving the screen in the water stratum; drop in the check valve and plunger, attach either pump, and you have a good well; or you can drive a pipe from the top of the ground, and make a good well in earth or sand, regardless of depth, as the pump is in the bottom of the well; or, if you have a poor drive well, with only half enough water, put this in and use air-chamber, and you will have a good well. The smallest pipe we use for the valves to work in is a two-inch pipe, and by taking off the top of the pump, the valves can be withdrawn, and the strainer also, if you choose. ☞Does not tear the screen in driving.

Price same as Fig. 75.

CHAPMAN'S OIL WELL PUMP CYLINDERS.

Fig. 21.

Fig. 21 represents a brass lined iron pipe, as smooth as glass, to work the suckers in, and made a part of the tube. Used only in dug and bored wells.

2	inch	calibre,	with	Chapman's	valves,	20	inches	long	(emir) $12 00
2½	"	"	"	"	"	20	"	"	(empire) ... 18 00
3	"	"	"	"	"	24	"	"	(err) 22 00
4	"	"	"	"	"	24	"	"	(ago) 42 00

CHAPMAN'S ADJUSTABLE OIL WELL PUMP CYLINDER.

☞We are also prepared to furnish brass Cylinders to go into the well after it is completed.

Price,	complete,	with	Chapman	Valves,	1 15-16	inches	diameter,	3 feet	long (ignite) $15 00
"	"	"	"	"	2⅜	"	"	3 "	(inspire) 21 00
"	"	"	"	"	2⅞	"	"	3 "	(entwine) 28 00

ROD SOCKETS.

Fig. 151.

Malleable Iron ⅜ inch, 14 Threads to the inch, per pound ..... 25 cents
" " 7-16 " 12 " " " " ..... 25 "
Brass ⅜ inch, 14 Threads to the inch, per pound ..... 40 "
" 7-16 " 12 " " " " ..... 40 "

⅜ Iron Rod Sockets, 4 cts. per foot, random length, extra for fitting.

CHAPMAN'S WELL WOOD ROD COUPLINGS.

Fig. 49.

Screws together and is riveted to the wood rods,

	For 2 in. well with rivets.	Fitted with wood rods.	For 3 in. well with rivets.	Fitted with wood rods.
Plain	40 cts.	$1 00	60 cts.	$1 50
Galvanized	50 "	1 10	75 "	2 00

Wood rods only 40 cts. for 2 inch well; 60 cts. for 3 inch well.

SPECIAL NOTICE.

Some parties are making a rod coupling that weighs about one-half pound. Our Coupling, for 2-inch wells, weighs one and one-quarter pounds. They are calling it our coupling, hence this notice. You will find our coupling tested by years of experience, and is well suited to meet the trade. Anything lighter will be a damage to you and injure the reputation of the well.

IRON PIPE CYPHER, FOR ORDERING BY TELEGRAPH.

NUMBER OF FEET.	SIZE.	PLAIN.	SIZE.	GALVANIZED.
25 Africa.	⅛	Alleghany.	¼	Amazon.
50 Alabama.	¼	Baltimore.	⅜	Bay.
75 Cuba.	⅜	Camden.	½	Colorado.
100 Asia.	½	Detroit.	¾	Danube.
200 Belgium.	¾	Erie.	1	Elbe.
300 Chili.	1	Fairmount.	1¼	Firth.
400 Denmark.	1¼	Galena.	1½	Ganges.
500 Egypt.	1½	Harrisburg.	2	Hudson.
600 France.	2	Ithaca.	2½	Indus.
700 Germany.	2¼	Jamestown.	3	Juniata.
800 Holland.	3	Kensington.	3½	Kanawha.
900 Ireland.	3½	Lancaster.	4	Lake.
1000 Japan.	4	Macon.	4½	Miami.
2000 Kentucky.	4½	Quincy.	5	Nile.
3000 Liberia.	5	Newark.	6	Osage.
4000 Maine.	6	Oneida.	7	Po.
5000 Nevada.	7	Paris.	8	Rhine.
6000 Ohio.	8	Reading.	9	Seine.
7000 Peru.	9	Salem.	10	Tweed.
8000 Russia.	10	Troy.		
9000 Spain.				
10000 Texas.				

WROUGHT IRON PIPE.

Size inside	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Size outside	.67	.84	1.05	1.31	1.66	1.90	2.37	2.87	3.50	4.00	4.50	5.00	5.56	6.62
Nominal w'gt lbs. pr ft	.56	.85	1.12	1.67	2.25	2.69	3.66	5.77	7.54	9.05	10.72	12.49	14.56	18.77
Per foot iron	3¾	4¾	6	8	11	21	26	38	50	67	84	1.00	1.10	1.50
Per foot galvanized	5½	6	7½	10½	14	24	30	47	62	83	1.00	1.25	1.50	2.00

SPECIALLY PREPARED WELL TUBING.

We keep in stock tubing especially fitted for the Chapman Tubular Well, standard pipe weight, guaranteed to have a free inside surface and the ends reamed ready for use. Our smooth bored iron cylinder should be used for the plunger to work in. In ordering be careful to mention Specially Prepared Well Tubing. When ordering by telegraph add the word PREPARED to the ordinary pipe cypher, or the ordinary standard gas pipe will be sent you. We keep nothing but a first-class article.

To net price of standard pipe add for fitting as follows:

2	2½	3	3½	4	4½	5	6
6 cts.	8	10	12½	15	18	21	25

ELBOWS.

SIZE	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Malleable, each	5	6	9	16	23	32	50	75	1 40	2 05	2 80	----	----	----
Galvanized	6	8	12	22	32	45	72	1 10	2 10	3 10	4 10	----	----	----
Cast	---	---	---	---	---	---	---	---	---	---	1 60	2 00	2 50	3 50

TEES.

Malleable, each	6	8	12	19	26	40	60	1 00	1 60	2 40	3 20	----	----	----
Galvanized	7	10	16	26	36	56	86	1 40	2 40	3 50	4 60	----	----	----
Cast	6	8	12	16	22	31	46	90	1 35	1 80	2 40	3 00	3 75	5 25

CROSSES.

Malleable, each	7	10	17	26	35	54	80	1 70	2 60	----	3 75	----	----	----
Galvanized	8	12	22	35	48	70	1 10	2 30	3 50	----	5 00	----	----	----
Cast	---	---	15	20	30	42	60	1 20	1 80	2 40	3 20	4 00	5 00	7 00

BUSHINGS.

Malleable, each	5	6	7	8	10	14	20	30	45	----	----	----	----	----
Galvanized	7	8	9	11	15	20	30	45	65	90	1 20	1 50	2 10	3 00
Cast	---	6	7	8	10	14	20	30	45	80	1 00	1 30	1 90	3 75

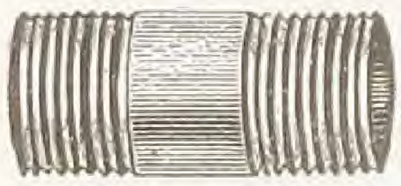
CAPS.

Malleable, each	3	5	8	11	15	22	30	45	65	85	1 15	----	----	----
Galvanized	5	7	10	14	20	30	40	60	90	1 20	1 60	----	----	----

NIPPLES.

Galvanized	8	9	11	13	17	23	32	45	65	85	1 15	----	----	----
Wrought Iron	6	7	9	10	14	17	25	----	----	----	----	----	----	----

NIPPLES.



Galv'd	11	13	16	19	24	34	40	85	1 10	1 40	1 90	2 40	3 00	4 00

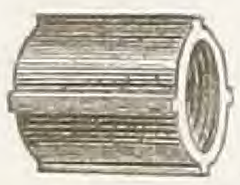
LOCK NUTS.

Malleable, each	3	4	5	6	8	11	16	----	----	----	----	----	----	----
Cast	---	---	---	---	---	---	----	25	45	60	80	1 00	1 30	1 90

REDUCERS.

Malleable, each	4	6	10	15	21	28	44	64	1 00	1 50	2 00	----	----	----
Galvanized	5	8	13	20	38	46	60	85	1 30	1 90	2 50	----	----	----
Cast	---	---	---	---	---	---	----	----	1 00	1 50	2 00	2 50	3 00	4 00

COUPLING PIPE.



Malleable, each	4	6	10	15	21	28	44	----	----	----	----	----	----	----
Galvanized	5	7	13	20	28	36	60	----	----	----	----	----	----	----
Wr't Iron, R. H.	6	8	10	13	17	21	28	40	50	75	95	1 25	1 50	2 15

UNIONS.

Malleable, each	16	19	23	28	38	48	72	1 35	2 10	----	4 00	----	----	----
Galvanized	22	26	34	42	55	70	1 04	1 80	2 80	----	5 60	----	----	----

RETURN BENDS.

Malleable	---	12	19	26	44	64	1 00	1 25	----	----	----	----	----	----
Galvanized	---	15	24	35	60	85	1 35	----	----	----	----	----	----	----
Between c't's	---	1 1/4	1 1/2	1 7/8	2 1/4	2 1/2	3	4	----	----	----	----	----	----

FOUR-WAY TEES.

Malleable	---	---	30	35	---	---	----	----	----	----	----	----	----	----

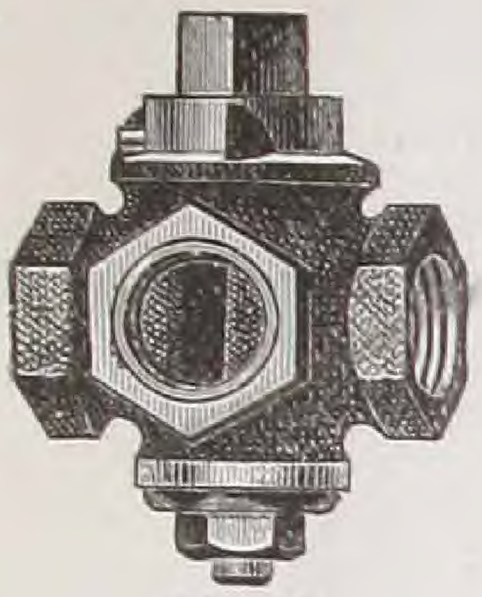


Fig. 83.

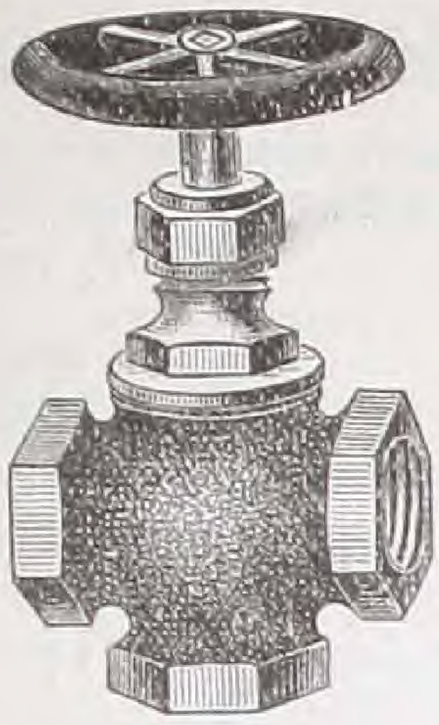


Fig. 84.

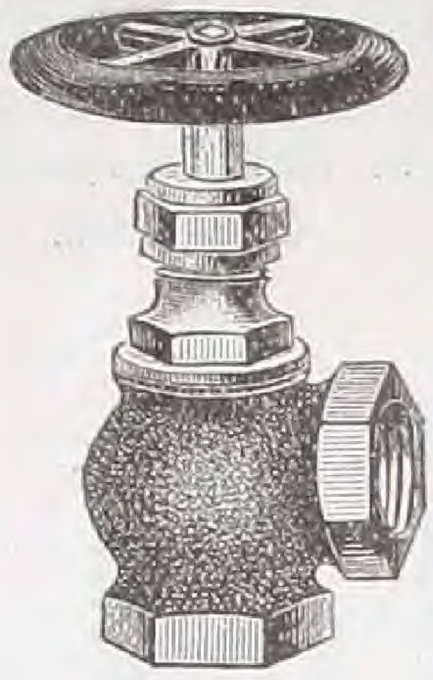


Fig. 85.

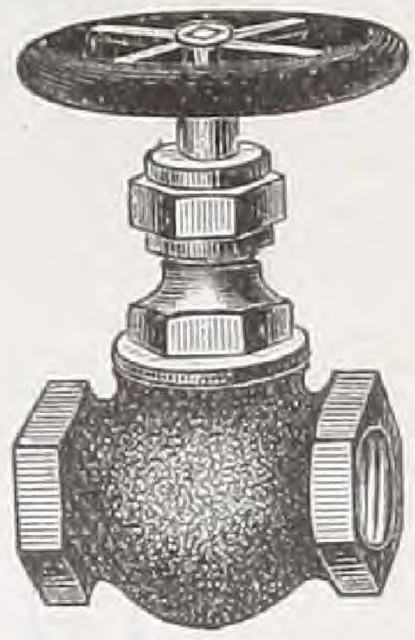


Fig. 89.

Fig. 88.

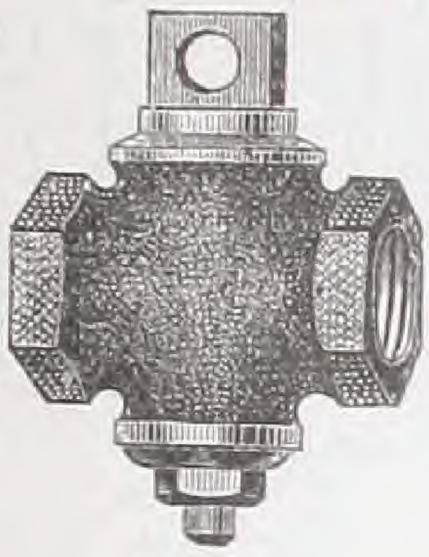


Fig. 90.

Fig. 87.

Fig. 86.

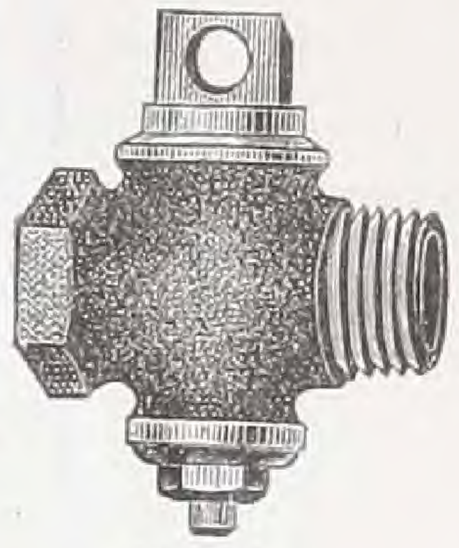


Fig. 91.

Size, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Globe Valve, Fig. 83	.60	.60	.75	.95	1.30	1.70	2.60	3.60	5.60	11.25	16.00
Angle Valve, Fig. 84	.60	.60	.75	.95	1.30	1.70	2.60	3.60	5.60	11.25	16.00
Cross Valve, Fig. 85	--	--	1.00	1.50	2.00	2.50	3.50	5.00	8.00	16.00	24.00
Check Valve, Fig. 86 and 87	.50	.50	.55	.80	1.10	1.40	2.25	3.10	4.90	10.00	14.00
Steam Cocks, Fig. 88, flat or sq. heads,	.65	.65	.75	1.05	1.45	2.00	3.20	4.40	6.50	13.75	20.00
Three-way Cock, Fig. 89	--	--	--	1.80	2.50	3.40	4.70	6.00	9.00	17.00	24.00
Gas Service Cock, Fig. 90	--	.50	.60	.70	.95	1.20	1.80	2.60	4.25	----	----
Gas Service Cock, Male and Female, Fig. 91	--		--	.80	1.05	1.50	2.20	3.20	----	----	5.00

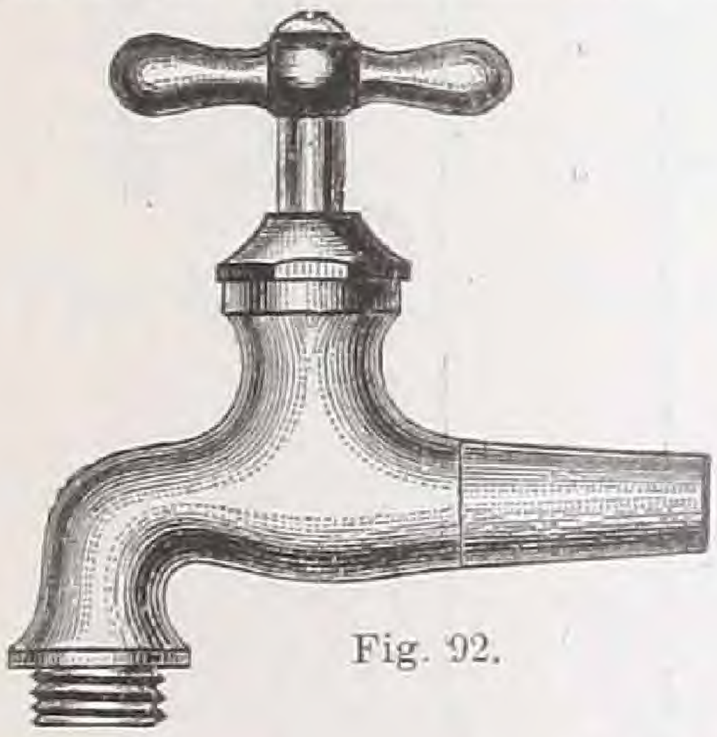


Fig. 92.

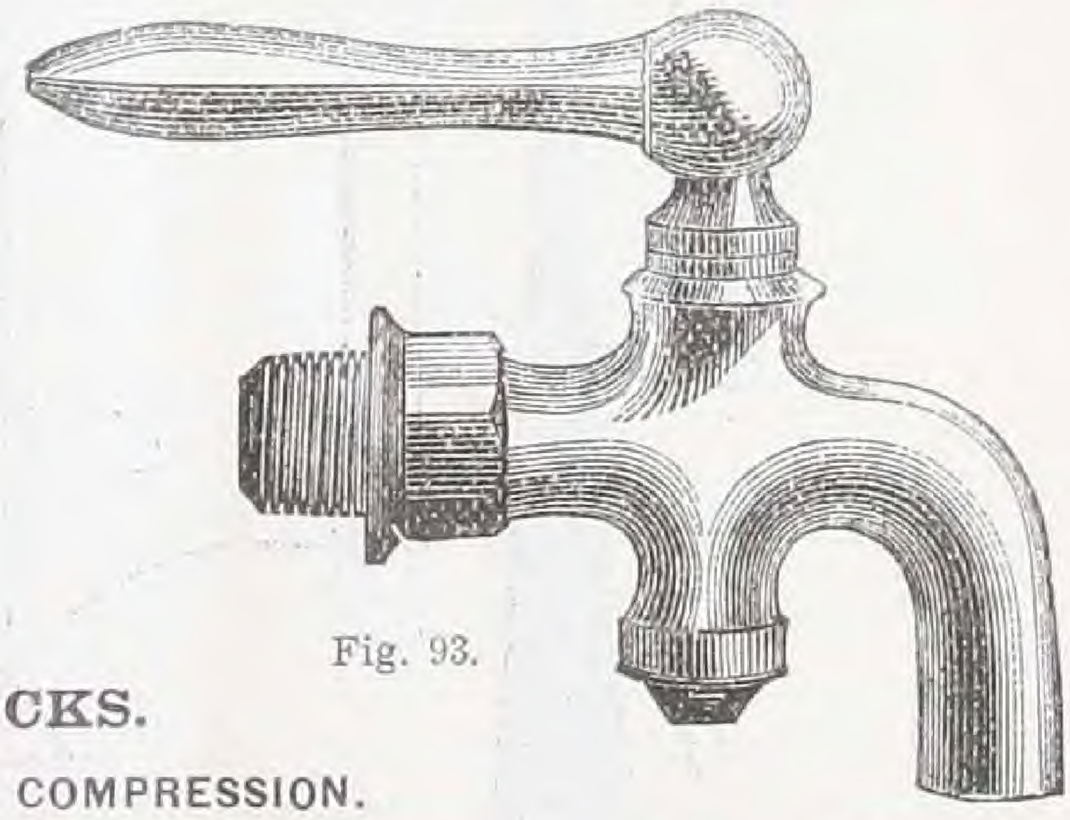


Fig. 93.

BIB COCKS.

LEVER HANDLE AND COMPRESSION.

Size, inches	1/2	3/4	1	1 1/4	1 1/2	2
Bibb Cocks for Iron Pipe, rough	$1 50	$2 60	$3 50	$5 75	$7 00	$13 00
" " " " finished	1 60	3 00	4 00	7 00	8 50	15 00
" " " " and Hose, rough	2 10	3 00	4 00	7 00	8 50	15 00
" " " " " " finished	2 30	3 50	4 50	7 75	9 25	17 00
Compression Bibbs for Iron Pipe, finished	2 00	3 00	4 00	----	----	-----
" " " " and Hose, finished	2 50	3 50	4 75	----	----	-----

STRAIGHT WAY STOP VALVES—Steam Metal.

Size, inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price, screwed, each	1 75	2 25	2 75	4 25	5 75	8 50	15 00	21 00

Size, inches	2	2 1/2	3	3 1/2	4
Price, flanged, each	16 00	24 00	32 00	50 00	75 00

Fig. 4.

STRAIGHT WAY STOP VALVES.

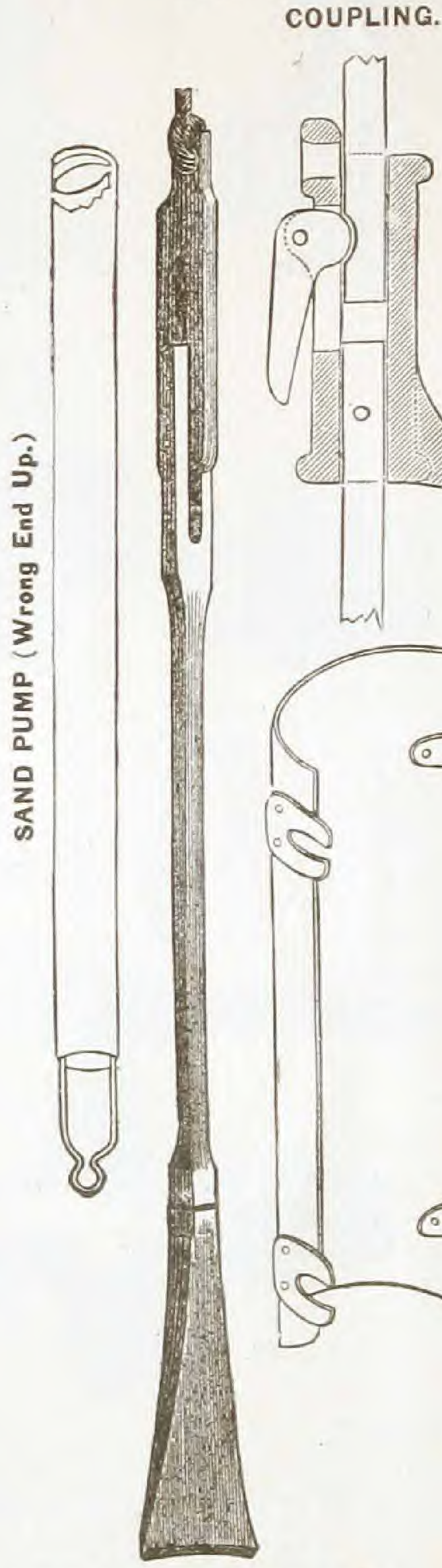
IRON BODY, BRASS MOUNTED.

Size, inches	2	2 1/2	3	3 1/2	4	5	6	8
Price, screwed, each	8 00	12 00	16 00	20 00	22 00	32 00	38 00	52 00
Price, flanged, each	9 24	13 50	18 00	22 50	25.00	36.00	43 00	60 00

Fig. 11.

CHALLENGE EARTH BORING AUGERS.

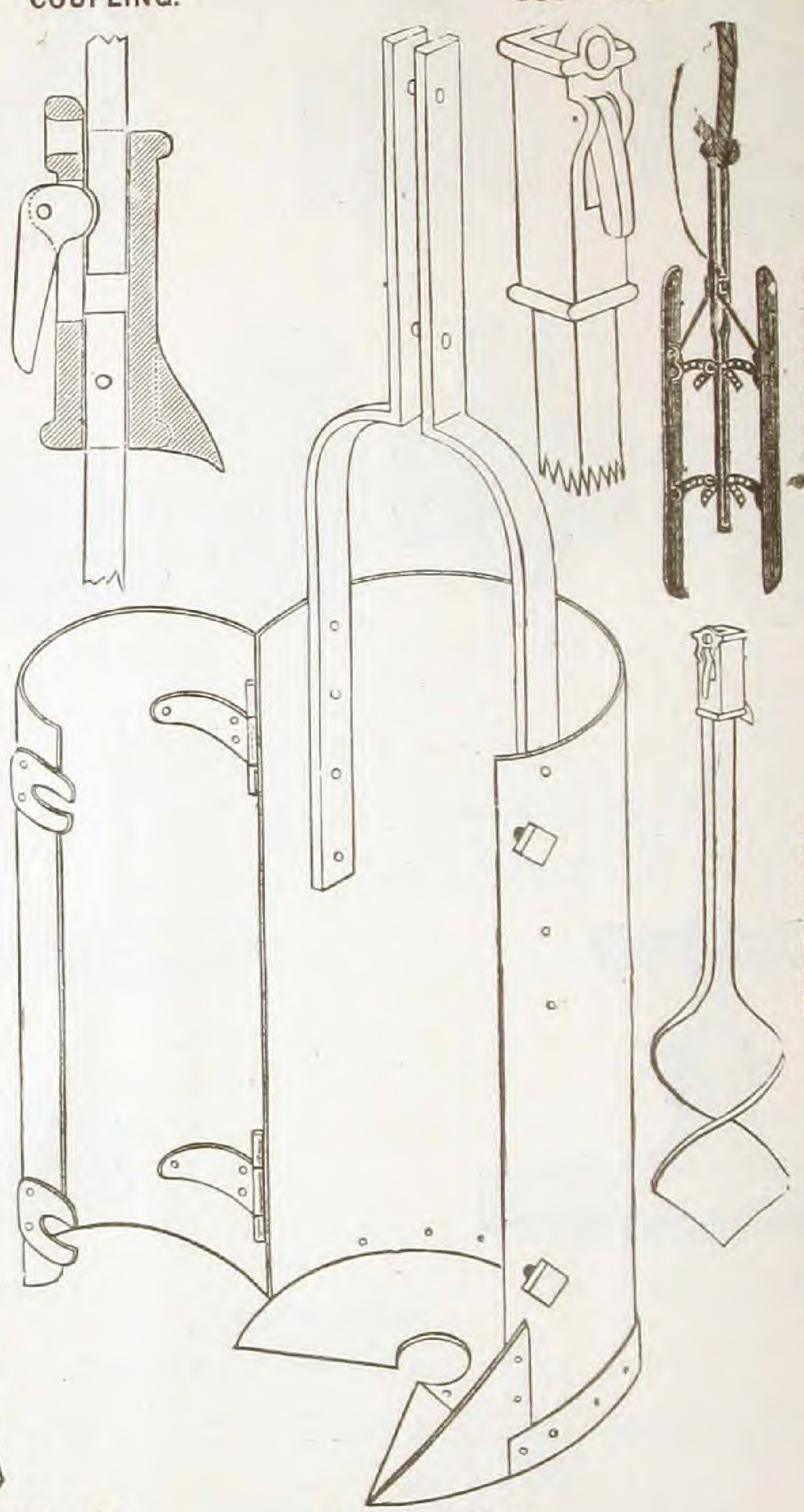
Directions for making derrick and for operating earth augers will be sent to parties purchasing our tools. State what you want, and we will quote you prices.



SAND PUMP (Wrong End Up.)

COMMON DRILL AND JARS.

COUPLING.



EARTH AUGER.

COUPLING.

TILE SETTER.

EARTH AUGER.

Challenge Well Augers

Are sold as follows: A full outfit for boring earth 60 feet in depth, consisting of 1 Challenge Auger with Reamer; 60 feet of 1⅜ shafting with self-couplers fitted on; 1 sand pump; 1 swivel hook for large rope; 1 wheel and pinion to run auger rope over; 2 pairs iron double boxes for derrick gearing; 1 spur wheel and pinion; 2 windlass axles; 2 cranks; 1 windlass drum; 1 brake; 2 boring levers for hand-power, and one for horse-power; 45 feet inch rope for auger; 80 feet ½-inch rope for guys; 75 feet ⅝-inch rope for sand pump; 8 bolts; 1 pulley wheel; 1-inch bolt, 12 inches long; in short, everything needed to bore a well, *except woodwork for derrick*, which a man can make in one day, or we will furnish a derrick complete for $15.00.

Outfit,	8 or 9-inch	Auger, all	complete,	1⅜-inch	Shafting ---------- $120 00
"	11 or 12-inch	"	"	1⅜-inch	" ---------- 125 00
"	15-inch	"	"	1⅜-inch	" ---------- 130 00
"	18-inch	"	"	1½-inch	" ---------- 140 00
"	20-inch	"	"	1½-inch	" ---------- 145 00

If a greater depth than 60 feet is required to be bored in earth, it is only necessary to get extra shafting and couplings.

Augers, 6 inches in diameter	$18 00
" 8 or 9 " "	25 00
" 11 or 12 " "	30 00
" 15 " "	35 00
" 18 " "	40 00
" 20 " "	45 00
Shafting, per foot, 1⅜ inches square, 45 c, 1½ inches square	50
Gas Pipe, Shafting, per foot	60
Patent self-couplings, each	2 00
Boring Levers, each	3 00
Heavy Lever, for Horse-power	6 00
Sand Pumps, each	6 50

The Tube Lifter is an ingeniously constructed little machine for lowering tubing where sewer pipe, earthen tubing or tiling is used, but is not needed where wood or galvanized iron is used. Consequently is not a part of the regular outfit, but is extra, and furnished at the price in list.

Reamer, 9 to 15-inch Auger, each	$ 3 00
Reamer, 18 to 20-inch Auger, each	3 50
Well Auger Derrick Gear—Shafts, Boxes, Spur Wheels, etc.	28 00
Swivel Hook	2 50
Spur Wheel	4 50
Pinion	50
Shive	1 75
Double Boxes, pair	60
Drill Bar—3 inch—and Jars combined, and Box	45 00
Tube Lifter	9 00
Rotary Drill or Twist Auger, 8-inch	16 00
" " " " 7-inch	14 00
" " " " 6-inch	12 00
" " " " 5-inch	9 00
" " " " 4-inch	7 00
Patent Self-Coupling, each	2 00

Auger Tools, for Extricating Boulders.

Screw Grapple, 6 to 12 inch	$20 00
" " 12 to 16 inch	25 00
Ram's Horn, 16 inch	12 00
" " 12 inch	10 00
" " 8 inch	8 00
Boulder Tongs or Grapple, 16 inch	20 00
" " " 12 inch	15 00
Stone Drop, 12 to 16 inch	25 00
Studded or Gang Drill, for 12 inch hole	45 00
" " " " 16 " "	55 00

The Challenge One-Horse Combined Well Boring and Rock Drilling Machine.

All complete, with 12-inch well auger, and all the necessary articles for boring 60 feet of earth, and a complete outfit for drilling to the depth of 100 feet, all ready to go to work, except wood work of derrick--$360 00

Consisting of one drill bar and jar, 1 drill bit 4 to 6 inches, 2 drill wrenches, 2 boring levers, 1 crooked lever for horse, 1 horse power, tumbling shaft and 2 couplings, 1 drilling swivel clutch, 1 swivel hook, 2 shive pulleys, 2 ⅞-inch bolts 12 and 14 inches, 2 hand cranks, spur wheel and pinion, 2 shafts, 1 windlass drum, 1 heavy balance weight, 1 tight and loose crank, 1 pitman, 1 crank clutch, 5 pairs boxes, 10½x8-inch bolts, 2⅝-inch bolts, 1 earth auger, 1 reaming knife, 60 feet 1⅜-inch shafting with patent self-couplers attached, 120 feet 1¼-inch hawser-laid drill rope, 120 feet ¾-inch sand pump line, 80 feet ½-inch guy lines, 45 feet 1-inch rope, 6 feet chain, 1 4-inch sand pump, 1 7-inch sand pump.

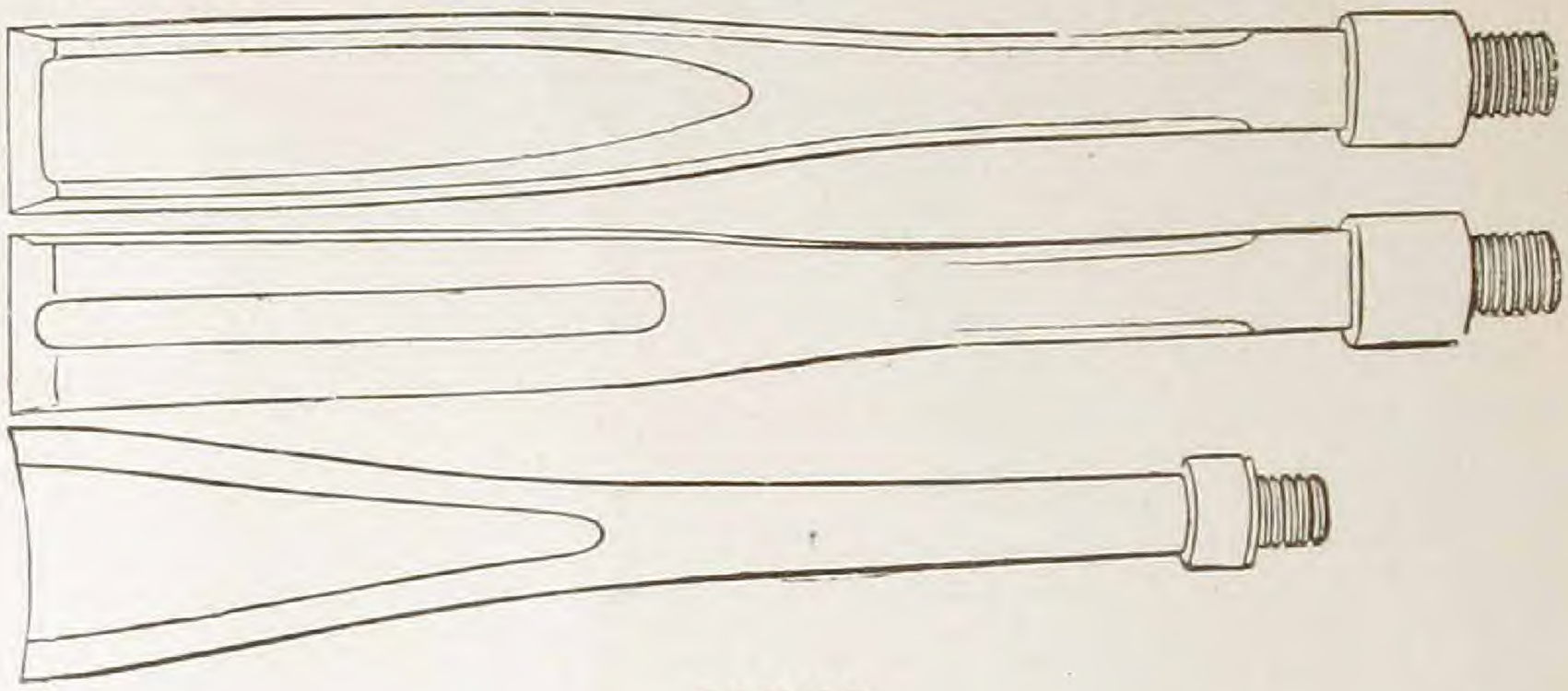
PRICES OF ROCK DRILLING TOOLS.

Used with horse and steam power, but not properly artesian tools :

3-inch Club Drill Bit	lbs. Steel	$18 00
4-inch " " "	"	24 00
5 inch " " "	"	27 00
6-inch " " "	"	30 00
7-inch " " "	"	35 00
8-inch " " "	"	40 00
3-inch Z " "	"	20 00
4-inch " " "	"	30 00
5-inch " " "	"	32 00
6-inch " " "	"	35 00
7-inch " " "	"	40 00
8-inch " " "	"	45 00
3-inch Reamer " "	"	20 00
4-inch " " "	"	30 00
5-inch " " "	"	32 00
6-inch " " "	"	35 00
7-inch " " "	"	40 00
8-inch " " "	"	45 00

ARTESIAN WELL DRILLING TOOLS.

CONCAVE AND FLUTED CLUB BITS.



REAMER.

We also furnish Tools for drilling *Artesian Wells,* with Pennsylvania Drilling outfits to go any depth. These Tools are much heavier than the Horse-Power Tools, and are therefore more costly, as per following list.

A Full Set of Drilling Tools for from four to six inch hole comprise: One Auger Stem, one Sinker Bar, two Small Bits, two Small Reamers, one Set Small Jars, one Rope Socket, one Temper Screw, two Heavy Wrenches.

A full set for large and small hole (large hole from seven to eight inch, small hole from five to six inch), comprises the same articles as mentioned above, and in addition one Set Large Jars, two Large Bits, one Large Reamer.

For price of a Full Set of Tools, add together the price of each article mentioned, as given on following pages, according to size, length and amount of steel desired.

We will make to order Full Sets of Tools either smaller or larger than those specified in this Catalogue.

We have made a SPECIALTY of manufacturing Drilling Tools for many years, and consequently we feel warranted in guaranteeing entire satisfaction.

CLUB BITS AND REAMERS.

3½ inch	20 lbs. Steel	$22.00
4 "	25 "	24.00
5 "	60 "	42.00
5⅝ "	60 "	42.00
6¼ "	70 "	50.00
8 "	80 "	55.00
Additional amount of Steel in Bits per lb.		.45
Re-Steeling Bits, for each pound of Steel used		.50

JARS, BOX AND PIN.

	Common.	Steel Lined.
2 inch hole	$35.00	
3 " "	40.00	
4 " "	45.00	$ 90.00
5 " "	50.00	115.00
Big hole		150.00

SINKER BARS AND AUGER STEMS, WITH BOX AND PIN.

2	inch	10	feet	$23.00	and	$1.00	per foot for each additional foot.		
2¼	"	10	"	30.00	"	1.00	"	"	"
2½	"	8	"	30.00	"	1.00	"	"	"
2¾	"	8	"	34.00	"	1.50	"	"	"
3	"	8	"	36.00	"	1.50	"	"	"
3¼	"	6	"	32.00	"	2.00	"	"	"
3½	"	6	"	35.00	"	2.00	"	"	"
4	"	10	"	75.00	"	3.50	"	"	"

MISCELLANEOUS.

Boxes, Heavy, $2\frac{3}{4}$ and larger	$ 17.00
Boxes, $2\frac{5}{8}$ and under	12.00
Pins, Heavy, $2\frac{3}{4}$ and larger	10.00
Pins, $2\frac{5}{8}$ and under	7.00
Rope Knife	12.00
Reducing Sub	16.00
Boring Swivel	16.00
Temper Screw	60.00
Rope Socket	20.00
Tool Wrenches, each	13.00

FISHING TOOLS.

Slit Spear, small	$ 40.00
Slit Spear, large	50.00
Horn Socket	30.00
Horn Socket, Adjustable Bowl	40.00
Bulldog Socket, small hole	60.00
Bulldog Socket, large hole	75.00
Slip Socket, small hole	100.00
Slip Socket, large hole	150.00
Grabs, small hole	55.00
Grabs, large hole	90.00
Winged Substitute, 8-inch hole	100.00
Hollow Reamer, small hole	100.00
Hollow Reamer, large hole	140.00
Rope Grabs	23.00
Hook, according to length	17.00 to 35.00
Star Reamer, small hole	50.00
Star Reamer, large hole	85.00
Slip Spear, small	40.00
Slip Spear, large	50.00
Rasp	60.00 to 70.00
Spud	35.00
Spear	60.00 to 80.00
Sand Pump Grabs	14.00
Sand Pump Hooks	7.00

COMBINATION SAND PUMP.

2 to $2\frac{1}{2}$	inch	$21.00	4	inch	$35.00
$2\frac{3}{4}$	"	22.00	$4\frac{1}{2}$	"	37.00
3	"	23.00	5	"	38.00
$3\frac{1}{4}$	"	25.00	5 3-16	"	40.00
$3\frac{1}{2}$	"	30.00	$5\frac{5}{8}$	"	42.00

These pumps are measured by the inside diameter of the tube.

Drive Pipe, 8-inch	Market price.
Drive Pipe Shoes	$23.00
Drive Pipe Heads	20.00
Hawser-laid Drill Rope, $1\frac{3}{4}$ inch	

RIG IRONS.

Complete, Single Flanges, per set, consisting of 1 Shaft, 1 Crank, 1 Collar, 1 Wrist Pin, 1 pair Flanges and Bolts, 2 Keys, 2 Boxes and Bolts, 1 Saddle, 2 Side Irons, 1 Sand Pump Pulley, 1 Derrick Pulley, 1 Stirrup, Walking Beam Hook, 2 Gudgeons with Bands $85.00

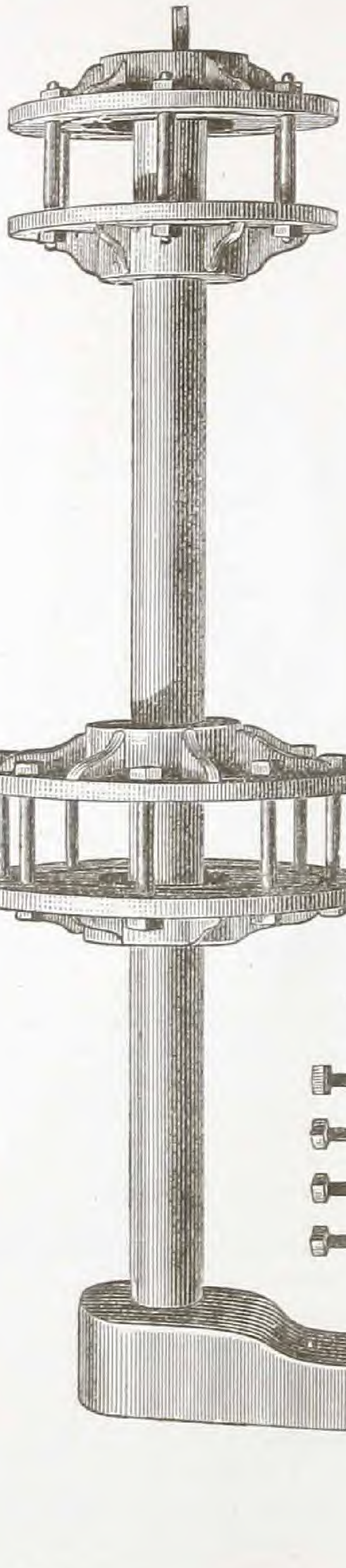
RIG IRON OUTFITS.

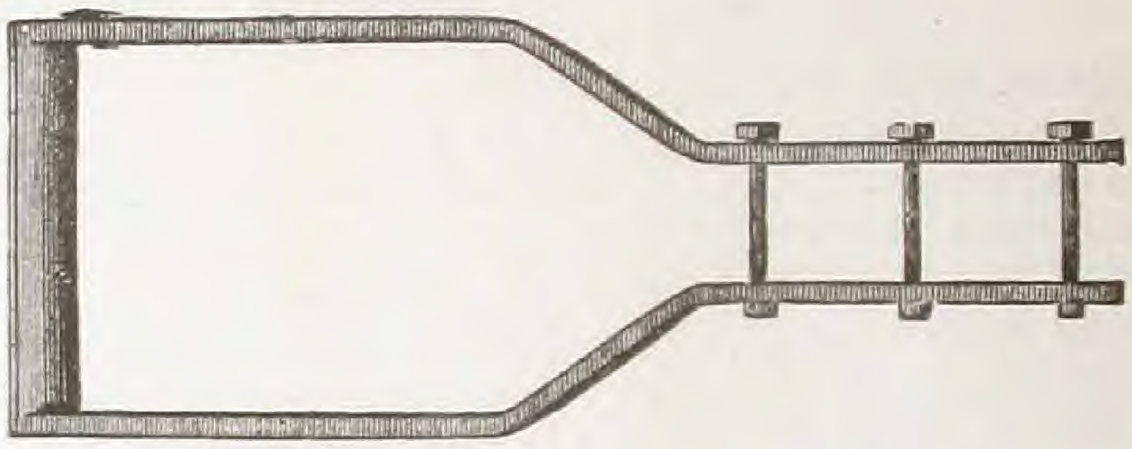
Complete, Single Flanges, consisting of 1 Set of Rig Irons, 1 Sand Pump Reel, 1 Back Brake, 1 Brake Lever, Band and Staple, $2\frac{1}{2}$ Kegs Nails, 6 Extra Bolts .. $110.00

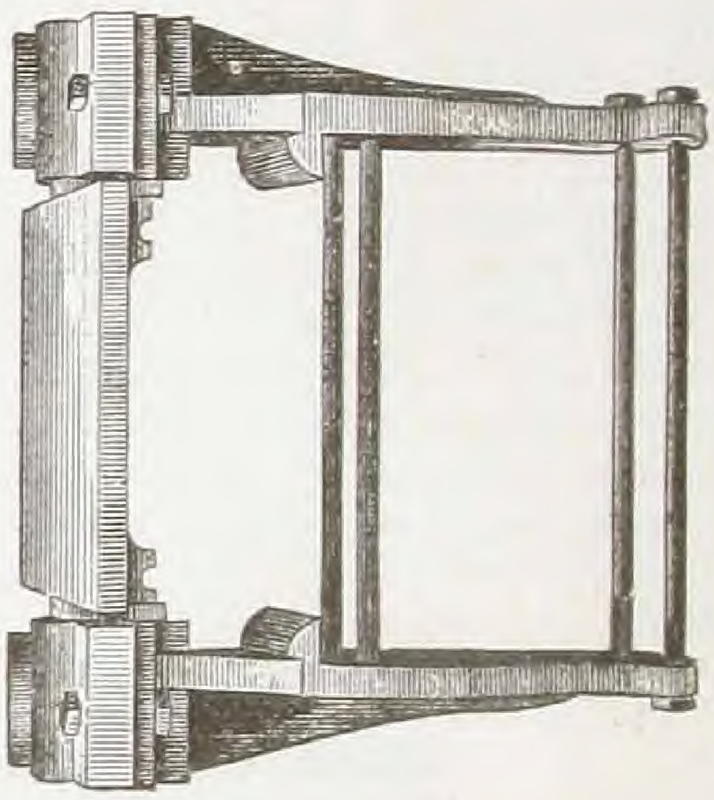
Engine and Boiler ..... Price on application.

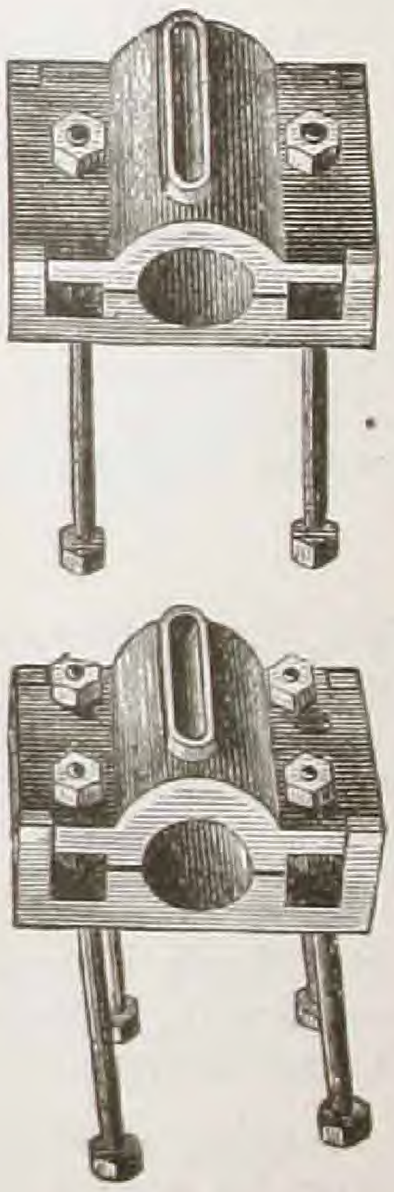
We furnish, when desired, blue print plans to scale, showing in detail how to set up the timbers for second motion and derrick.

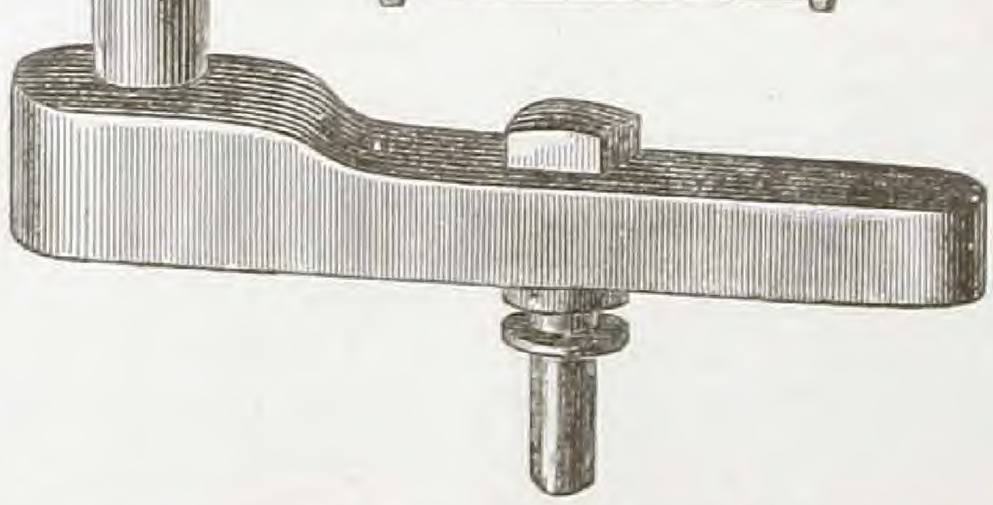
Complete Set of Well Rig or Derrick Irons.

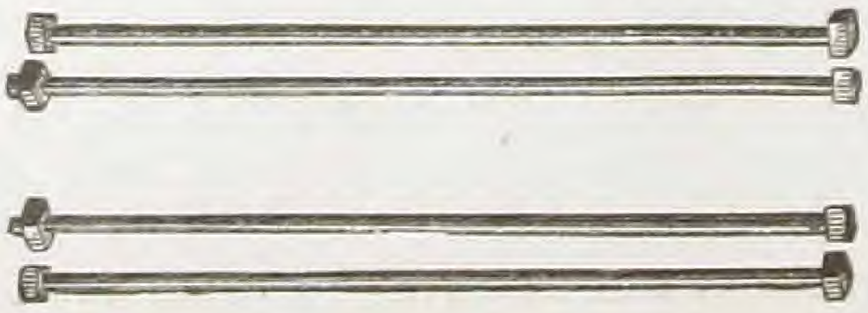












ARTESIAN DRILLING TOOLS.

SMALL BIT.

LARGE BIT.

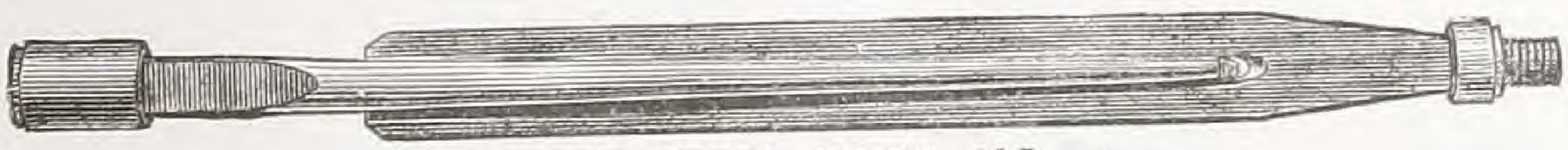
FLAT REAMER

HALF ROUND REAMER

ROUND REAMER

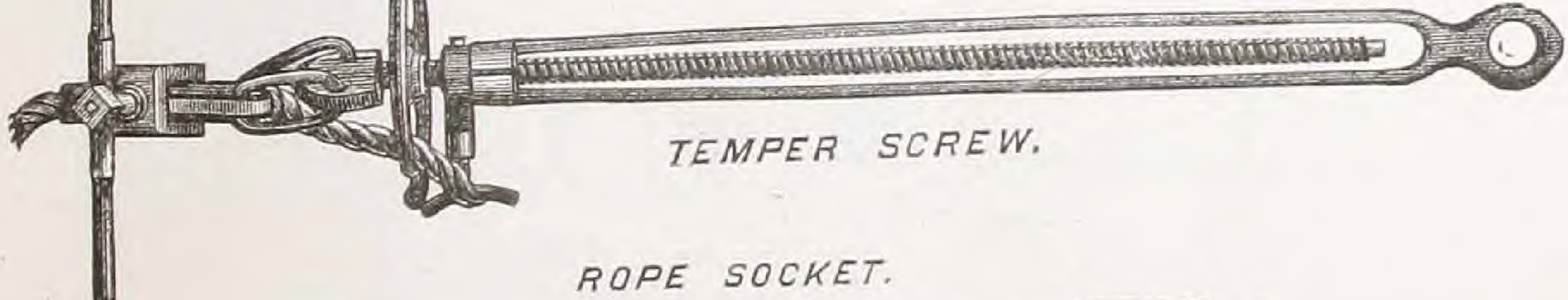
AUGER STEM, SINKER BAR, SUBSTITUTE.

SAND PUMP.

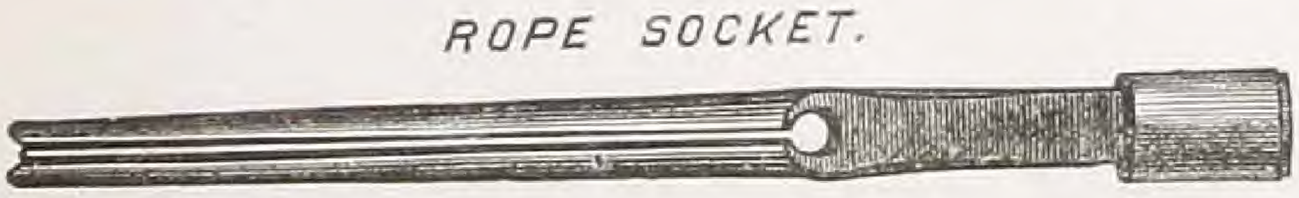


PATENT STEEL LINED JAR.

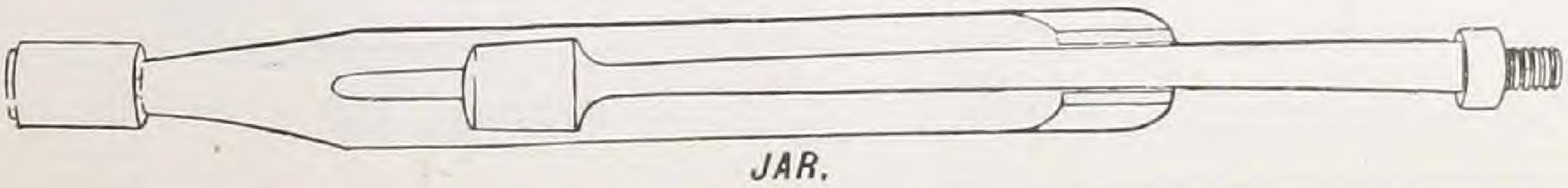
WRENCH.



TEMPER SCREW.



ROPE SOCKET.



JAR.

FISHING TOOLS.

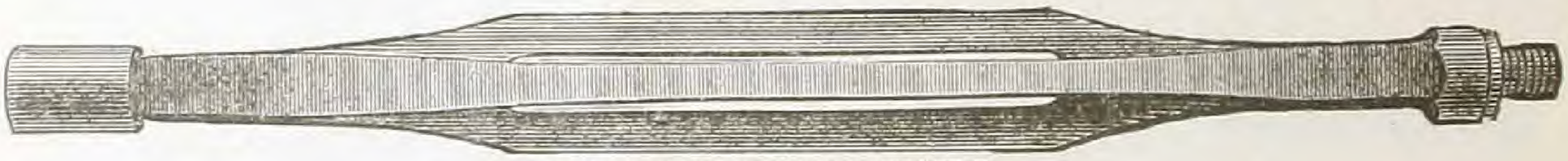
HORN SOCKET.

ROPE GRABS.

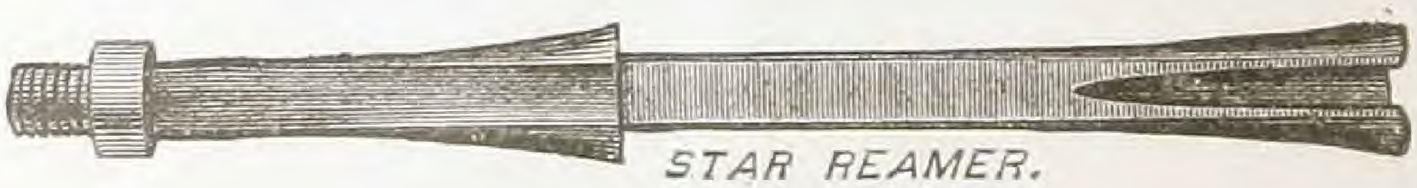
SLIP SOCKET

GRABS.

HOLLOW REAMER.

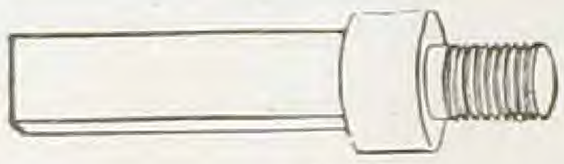


WINGED SUBSTITUTE.

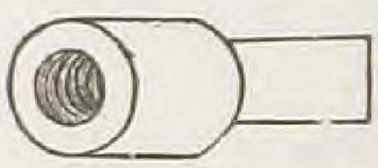


STAR REAMER.

SLIP SPEAR.

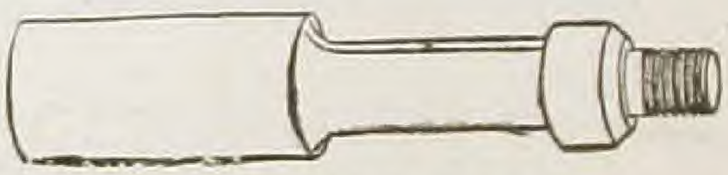


PIN.



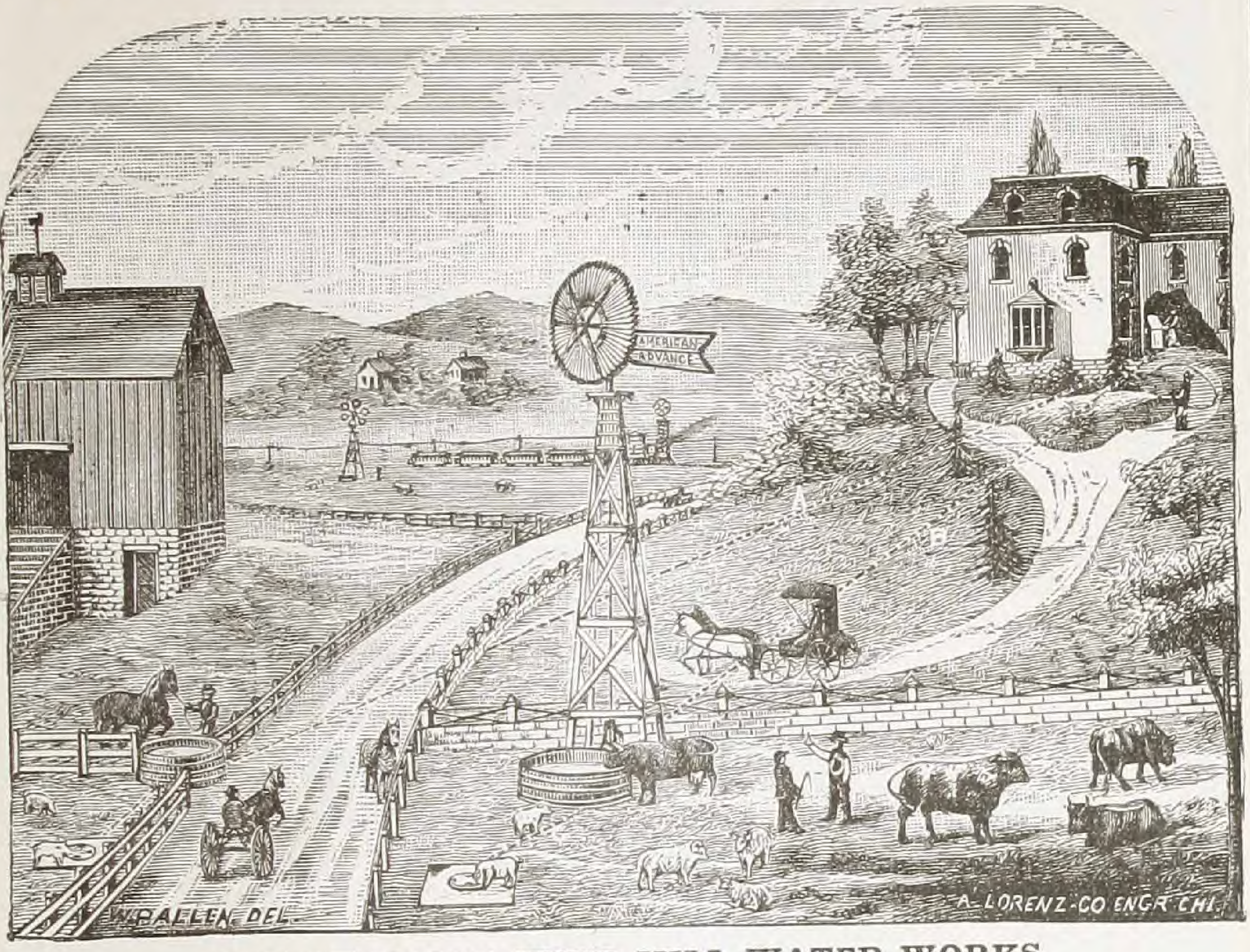
BOX.

SWIVEL.



REDUCING SUB.

The American Advance and Turbine Wind Mills.



THE CHAPMAN WIND MILL WATER WORKS.

This picture illustrates our system of Water Works connected with our Wind Mill. The Wind Engine is connected to our Fig. 102 Force Pump (see fore part of this Catalogue), and its operation is as follows: The Mill is set to work by simply throwing it in gear. Being connected to the pump, the water is conveyed through pipe (as seen by dotted lines) to the tank in the kitchen at the house After this tank is filled, the water runs into the stock tank and hog and sheep water, filling them all—and then the Mill stops, so as not to waste water or wear itself out, or make any unnecessary mud by the trampling of stock around the tank.

Question.—How does your Wind Engine stop itself?

Answer.—Each tank is provided with a Float Valve that shuts off the supply of water when filled. The Safety Valve in the pump opens by the extra pressure and discharges the water into a pail that is connected to the Shut-Off of the Wind Mill, and its weight then stops the Mill.

Q.—How do you start it to pumping again?

A.—It starts itself.

Q.—How?

A.—The pail that stopped the Mill has a small hole in its bottom, and when the water has run out it is lighter, and the Wind Mill goes in gear and pumps and repeats as before.

Q.—Suppose the water gives out in the well?

A.—We can make the Chapman Hydraulic Well with machinery, and warrant an inexhaustable supply of water or ask no pay. (See this Catalogue for prices.)

Q.—Will your mill grind feed and stop when the grist is ground?

A.—Yes.

Q.—What other kind of goods do you make?

A.—Hydraulic Well Machinery, that pumps a hole into the ground and makes a large reservoir at the bottom of the well; Artesian Well Tools, the Chapman Deep Well Tools and Supplies, Oil Well Goods, and Mining and Prospecting Machinery; also Broom Corn Machinery.

Q.—What advantage has your Hog Waterer?

A.—It furnishes a tank full of clear water, and is so arranged that small hogs cannot fall into it.

Q.—Does it freeze in winter?

A.—No; the lid opens and rises when the hog goes to drink and closes when he goes away.

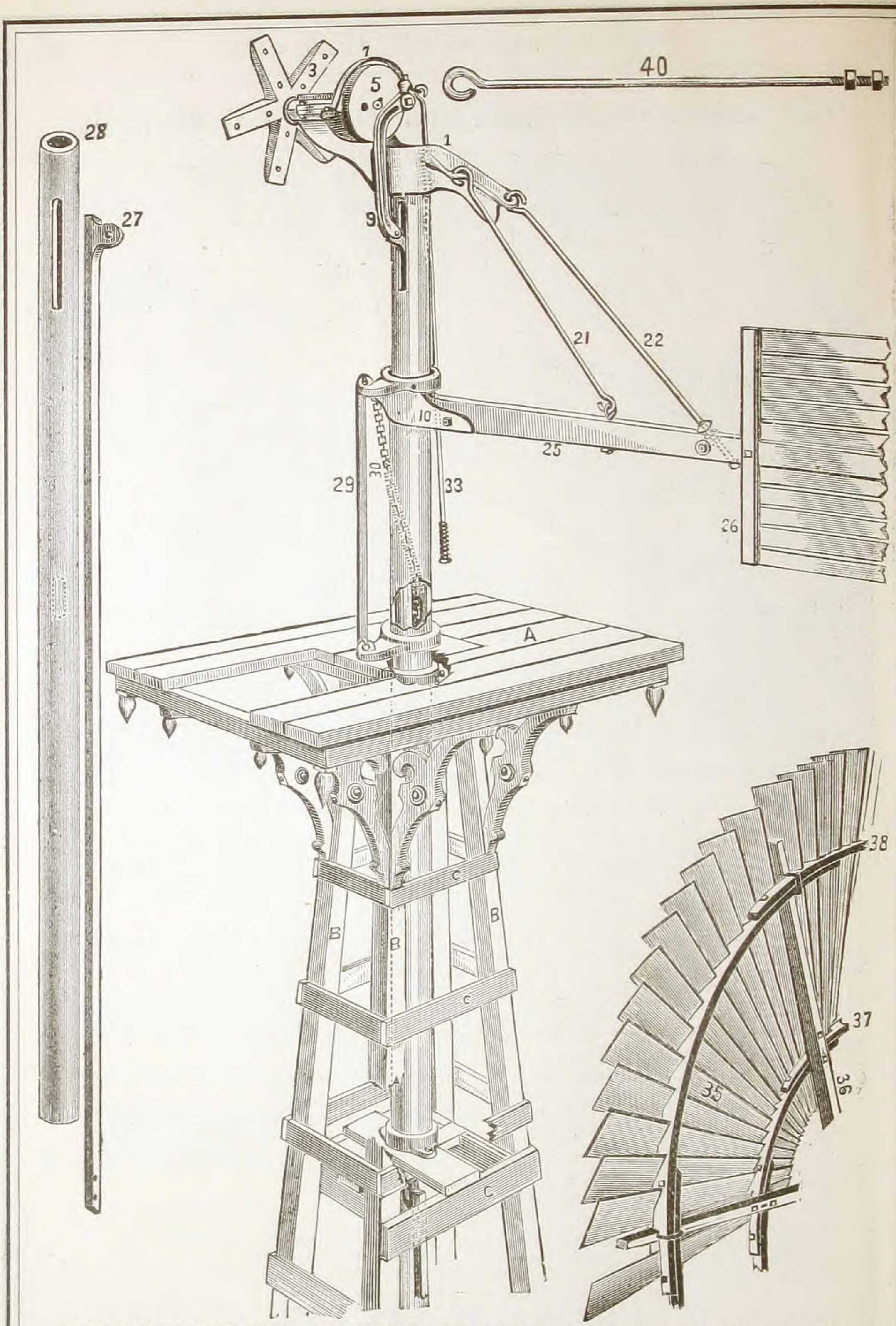
Q.—Does your Power Wind Engine have as much power as the Pumping Mill?

A.—Yes; we use double gearing, which overcomes the tendency to go out of the wind.

WARRANTY.

We warrant the ADVANCE and TURBINE WIND MILL to be a good, durable, self-regulating machine; well made of good material; to do good work in all kinds of wind; to be more reliable in storms, and to possess more power than any other Mill made; and agree to furnish, free of charge, the part or parts necessary to make good *any defect in workmanship or material used*, for the term of one year from date of erection.

AMERICAN WELL WORKS, AURORA, ILL.



DESCRIPTION OF THE "ADVANCE" WROUGHT IRON MAST WIND ENGINE.

The derrick and platform are built of wood. (See cut.) The hollow wrought iron shaft resting one-half its length below the platform on a pivot having a bearing in the platform, and extending far enough above the platform to allow the wheel to swing around. The main casting, No. 1, is secured to the upper end of the mast, and the bearings for the shaft of the wheel extend outward from the turning post the usual distance, then the arms or spokes of the wheels incline backward, so that the weight of the wheel rests upon the boxes. (See cuts on page 63.) The wind sails, pump rods, spokes and rudder are wood in the Advance and Wood Turbine. The Iron Turbine have iron sails and rudder; the working parts are otherwise alike. (There is a mistake in the drawing of the sail section. The arms or spokes must pass through the rim of the sail, directly the reverse of what it shows.) No. 30 is an iron rod, not a chain, as represented. We make the sail section with bent or straight reams, to suit the taste of purchaser.

DIRECTIONS FOR BUILDING TOWER.

(Fig. 8, W.)

First—Splice the Corner Posts, lay them side by side, and square them off to length.

Second—Space off the Posts from the Braces, marking square across the four sticks at once, according to the distance given in the cut. The first mark (5 feet from top) for 10-foot, and one-half the diameter for all other sized Mills. In building any height of Tower, always bring the first Brace to within two feet of the ground, and always put the Mast Sill at the distance from the top here given; the intermediate Crosses can be varied according to height of Tower, spacing off that corner of each Post which is to come on the inside. (See end view of Tower at top of cut.) Lay out two of the sticks in the form of cut A.

Third—The top should be 20 inches wide. Spread the bottom of the "A" 9 feet for a 36-foot Tower, and nail a temporary stay-lath to hold it in place. The rule for the bottom spread in all Towers is one-fourth the height. Tack on the Girts, bringing the upper edge to the marks as before stated, use each of these Girts as a pattern to cut the other three by, two of which should be cut two inches longer than pattern, to allow for lapping over the ends of the other two. Cut the diagonal Braces, using the first cut as a pattern to cut the other seven by, which belong in the same section of the Tower as the pattern. On four of the diagonal Braces of each set allow an extra inch to lap over the ends of the other four to cover the joints. To get length of diagonal Braces, measure across between the horizontal Girts diagonally from one corner to the other, and rack the corner Posts until the distances from one corner to the other each way are equal. Then scribe on diagonal Brace, using the first cut as a pattern for the other seven, allowing an extra inch on the end of four Braces, top and bottom, in each section, for lap to cover up the joints on the other four.

Proceed in the same manner with each section in the Tower, observing the following rule: that the diagonal Braces should all be of uniform length and cut, with the exception of those on braces, which allowance has been made for lap. The two braces which form the cross on each of the four sides of the Tower should be exactly alike, and the Tower posts racked out or in to accommodate the joint.

When the two sides of the Tower are completed, turn them up edgewise with Braces outside, set the four Posts in platform, and proceed to put the other two sets of Braces and Girts on. Raise the Tower up bodily by pulleys and ropes. Before anchoring, level the Tower with a spirit-level on the lower Girts. The Anchor-posts should be at least eight inches through at the bottom, and go into the ground at least five feet, and have a cross-piece on bottom, so Tower cannot pull up or sink down. Never drive in the Anchor-posts, but dig holes and set them down level. After building the ladder, as shown in the cut, nail it to the side of Tower most convenient. Put the Mill together as shown in Directions for Mill.

Bill of Lumber for 36-foot Tower.

4 pieces—4x4 —20 } Corner Posts.
4 " —4x4 —18 }
2 " —2x6 —12, Platform.
2 " —1x12—16, Platform.
4 " —2x4 —16, Ladder.
3 " —1x4 —16, Ladder.
20 " —1x6 —16, Braces.
8 $\frac{3}{8}$x4$\frac{1}{2}$ with Washers for Splice Bolts.
8 $\frac{1}{2}$x12 Anchor Bolts.
20 pounds 10d Nails.
2 pounds 20d Nails.

This size lumber is sufficient for 7, 8, 9, 10 and 12 foot Wind Mills.

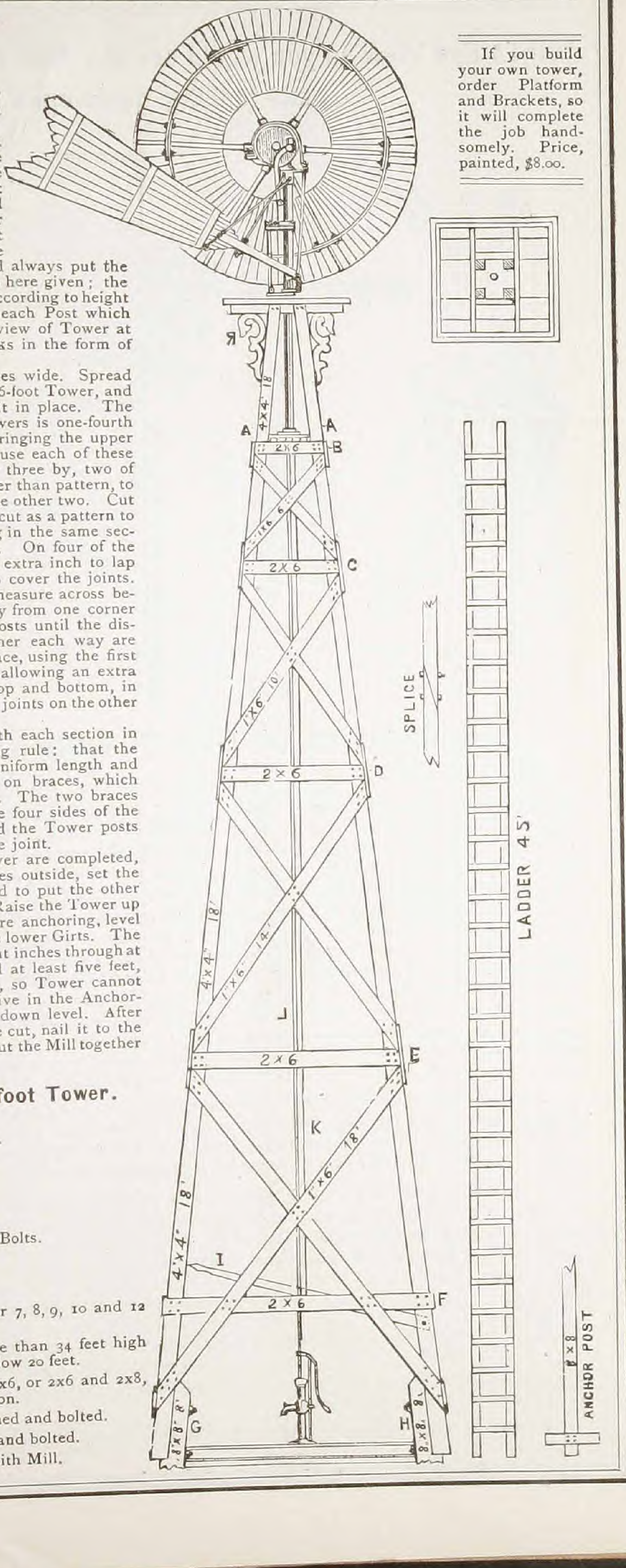
A Tower for a 12-foot Mill more than 34 feet high should have 4x6 in place of 4x4 below 20 feet.

13 and 14-foot Mills should use 4x6, or 2x6 and 2x8, spiked together in pig trough fashion.

15, 16 and 18-foot Mills, 8x8 framed and bolted.

20 to 24-foot Mills, 8x10 framed and bolted.

Estimates and plans furnished with Mill.



If you build your own tower, order Platform and Brackets, so it will complete the job handsomely. Price, painted, $8.00.

Bird's Eye View as you would see the Mill from a Balloon above, and looking down upon it.

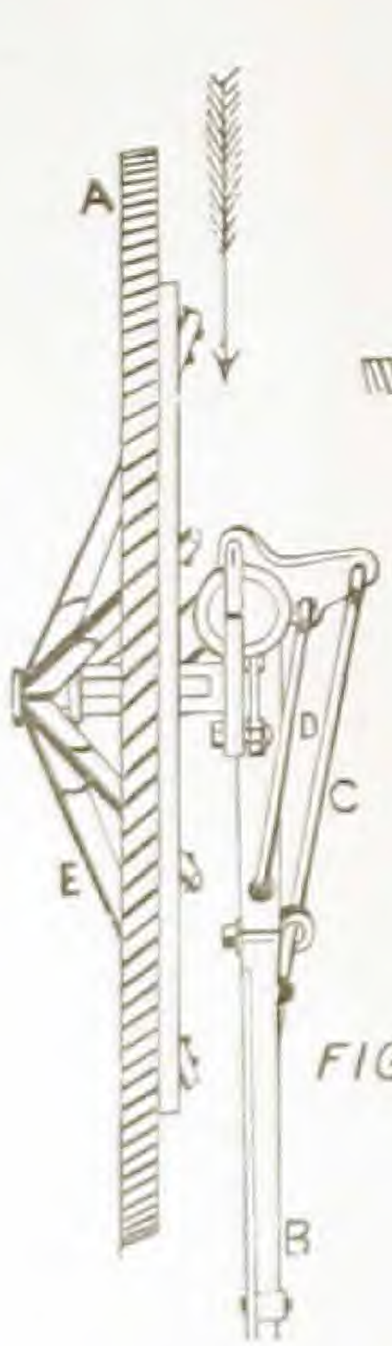


FIG. 1

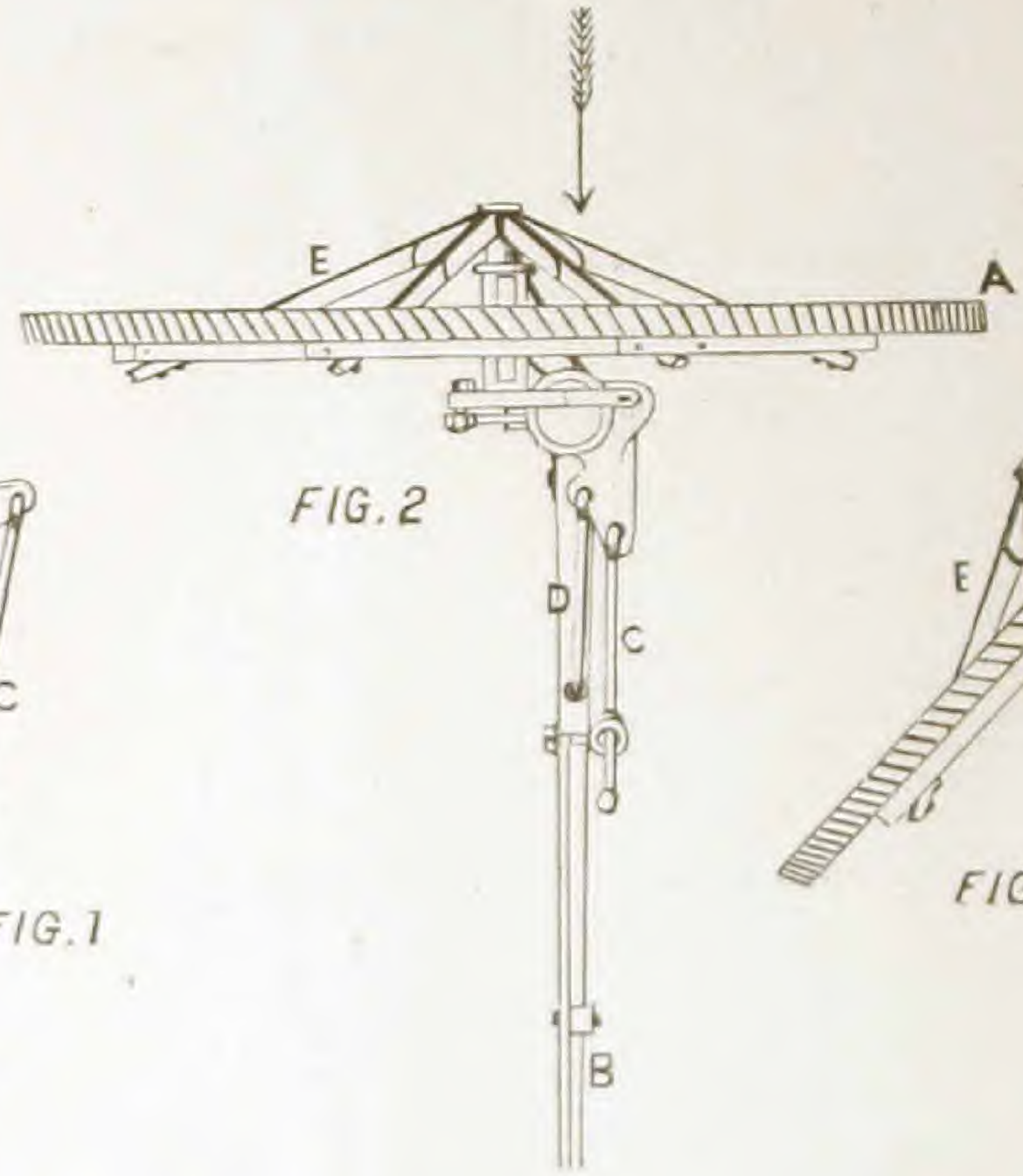


FIG. 2

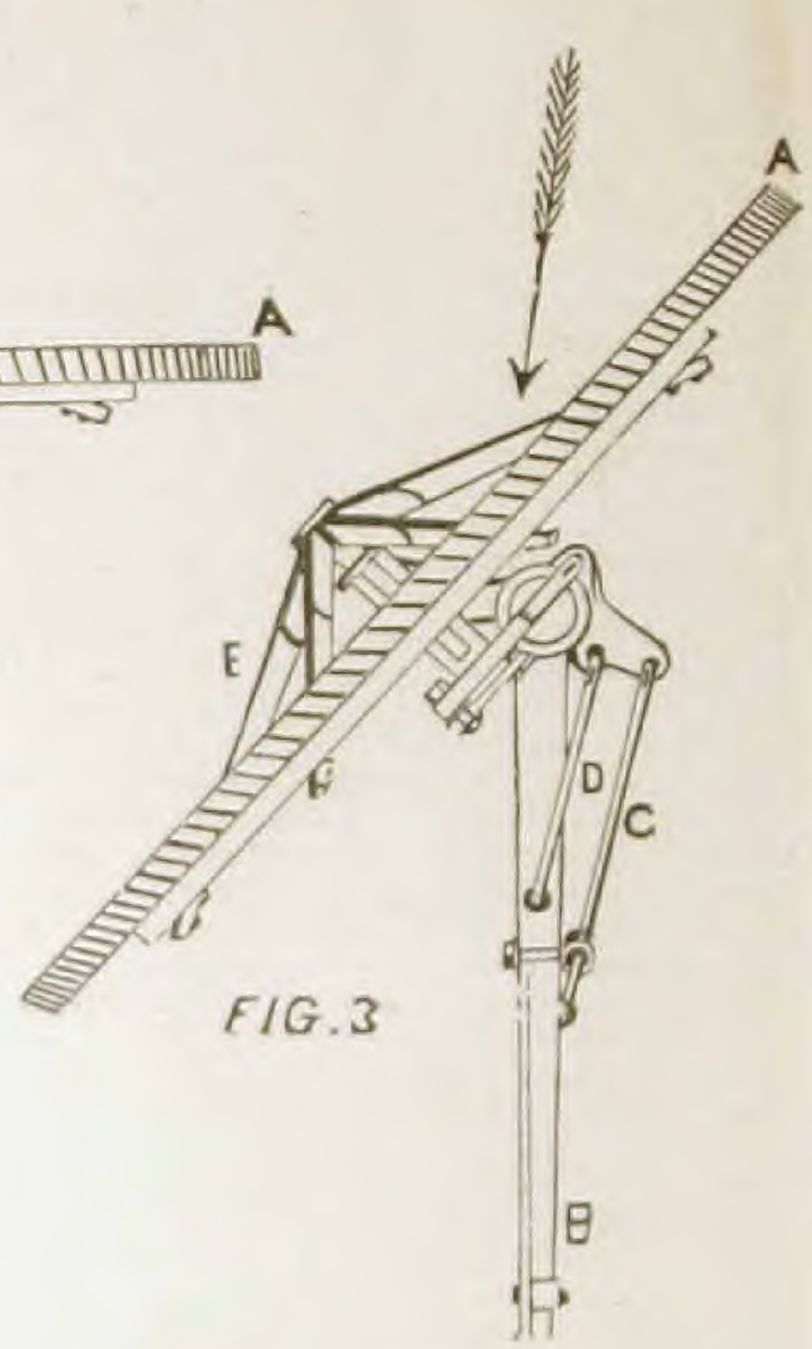


FIG. 3

OPERATION OF OUR PUMPING WIND MILL.

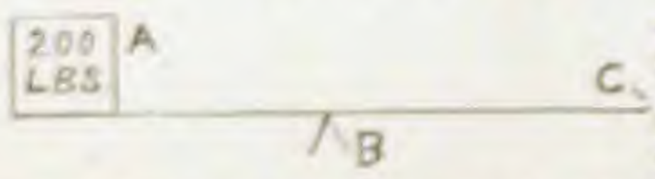
Figs. 1, 2 and 3 are a bird's eye view and plan of our "Advance" and "Turbine" Wind Mills.

A is the Wind Wheel, E the Spoke, B the Rudder, C the Rudder Director, D the Rudder Brace; the Arrow shows the direction the wind is blowing. Now suppose you were a bird and above the Mill looking down upon it, you would see it as represented in Fig. 2, the position of the Mill would be in a moderate wind, but if the wind blows hard, and has more force than is required to do the work with a moderate motion, the wheel is deflected from the wind and swings around towards the rudder proportionately as the wind increases, and proportionately performs the work required, as seen in Fig. 3; and if the wind blows very hard, the wheel will be brought nearly on a parallel line with the rudder. (See Fig. 1.) The figure shows the wind wheel at rest, Fig. 2 fully facing the wind in a position for work. Fig. 3 shows the wind wheel deflected to the wind, the wind blowing, in this case, with more force than is required to do the work. *The wrought iron mast*, upon which the wheel is mounted, stands perpendicular, the whole engine turns easily to any point of the compass to face the wind. The wind wheel shaft is set off from a line of the mast, and there being 15 per cent. more of the mast that swings toward the rudder, the rudder is so adjusted to it and the mast that when the wheel is folded towards the rudder the outer end of the rudder rises up and holds a balance between the wind and work performed. Seemingly like a thing of life—weighting to the wheel the amount of wind required for the work.

To stop the Mill by hand, take hold of the wire rod that is attached to rudder staff and pull down; then its weight hangs on 21 and seeks to raise it up straight; 22 is placed angular to the vane and directs it around parallel to the wind wheel. The rudder staff pulls down rod 33, and the break clasps the face plate and prevents the wheel from turning on its own axis, but leaves it free to change to the wind.

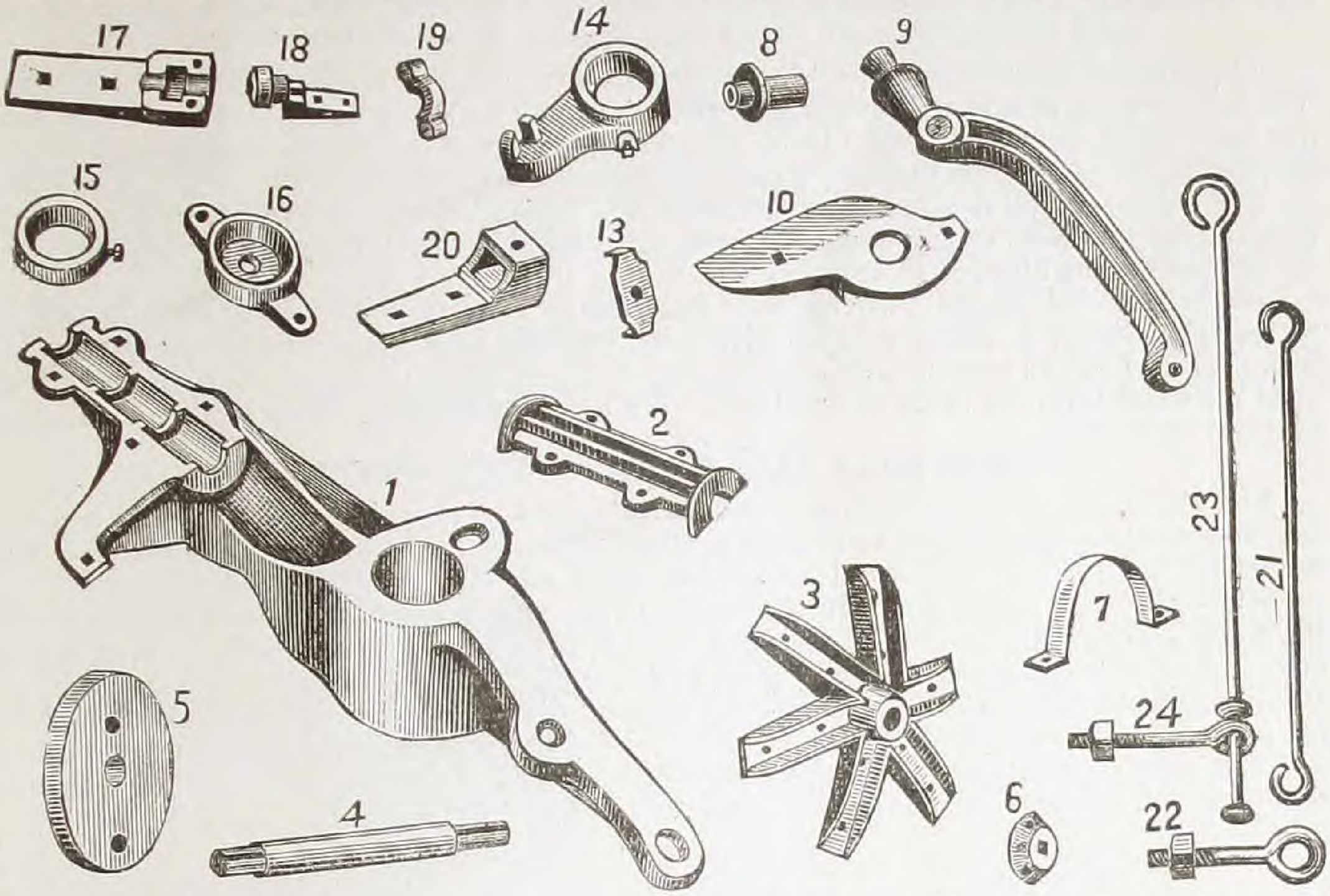
ADVANTAGES WE CLAIM, WHILE WE LEAVE YOUR JUDGMENT TO AFFIRM.

First—We claim that we have but one-third the friction that all other Wind Mills have. To illustrate our claim, we insert a cut representing other makers' Wind Wheel Shafts. Now let C represent the inner bearing and B the outer bearing; A, the wind wheel, weighnig 200 pounds. Now as A weighs downs 200 pounds, the bearing C must stand a strain of an equal amount of 200 pounds. Now add A and C together, and we have 400 pounds weight on B. Now the friction on B will be 400 pounds and on C 200. Add B and C together we have 600 pounds friction on the main shaft or three times the weight of the wind wheel—and figures will not lie. Now if you will examine Figs. 1, 2 and 3 on this page, you will see that by using the iron mast the arms slant backward and bring the weight of the Mill equally on the boxes. Hence there is no leverage with the shaft or journals.



400 plus 200 is 600, total friction of all Mills. Our Mill has only its weight of 200 lbs friction.

Parts of our Advance or Turbine Pumping Mill.



1. Main Casting.
2. Cap Box.
3. Spider.
4. Shaft.
5. Crank Plate.
6. Front Spider used on 12-foot Mill and Forger.
8. Crank Pin.
10. Rudder Staff Irons that slide up pipe.
14, 29. Rudder Stop.
15. Collar that prevents Mill from raising up.
16. Step or Pivot Iron.
17, 18, 19. Swivel.
20. Flat Pump Bar Connection.
12, 21, 22. Rudder Brass Connection.
23, 24, 13. Directing Rod Connection.
1 A. Brake Clamp. (See Fig. 5, page 59.)
25. Wrought Iron Mast.
26. Rudder Vane.
9, 27. Pitman.
30. Chain Shut-Off (should be Wire).
33. Brake Rod.
34. Clasp that holds Fan Section Spokes we use.
35. Fan Section.
36. Arms or Spokes.
37, 38. Reams of Wind Wheel.
40. Brass Rod that bridges the Wind Wheel.

Approximate Capacity of the "Turbine" and "Advance" Wind Mills.

Table showing the number of gallons of water per hour that our Wind Mills pump, when attached to suitable sized pumps, for the six elevations named:

Diameter of Mill.	25 feet Elevation.	50 feet Elevation.	75 feet Elevation.	100 feet Elevation.	150 feet Elevation.	200 feet Elevation.
7 feet wheel	539	269	---	---	---	---
8 " "	684	342	---	---	---	---
9 " "	891	445	297	---	---	---
10 " "	1150	573	398	255	---	---
12 " "	2236	1077	711	509	340	---
14 " "	2708	1414	918	674	468	300
16 " "	3876	1900	1172	967	586	484
18 " "	5860	3129	1950	1465	1049	732
20 " "	7497	3825	2448	1875	1157	956
25 " "	12742	6417	4296	2983	2240	1604

East of Illinois the average hours per day the Mills will run would be seven hours, and west of the Mississippi about ten hours per day.

The above figures are a low estimate of the capacity of our Mills.

THE "ADVANCE" AND "TURBINE" MILLS.

For Grinding Feed, Shelling Corn, Cutting Hay and Straw, Making Meal, and for all Power Purposes from 1 to 40 Horse Power.

The greatest labor saving machine ever invented. A self-regulating Wind Mill that will not blow away, and will grind feed, shell corn, cut hay and straw, make meal, graham and buckwheat flour, saw wood, elevate grain supply power for machine and work shops, for sawing, drilling, lathe turning, and all other purposes to which any power can be applied.

The cheapest motive power in existence is the force of wind. It can be utilized without preparation; no reservoirs, dams, or flumes, are needed to apply it by our machinery, and the proper engine alone is to be provided.

Having studied carefully the cause of breakage or damage to Wind Mills of all classes, we have set about to make a better Mill than has ever been made before, using wrought iron derrick head or mast of a small diameter, as the wood work above the platform has in most instances been the cause of breakage. We have been in the Wind Mill and Engine business since 1861.

WIND MILL BALANCED GEAR MOTION.

The object of our invention is to transmit full power of the wind wheel to the mechanism and use the whole power of the wind. The difficulty heretofore experienced was that the wheel could not face the wind. First the wind wheel gear would roll around on the perpendicular gear until the wind pressure on the opposite side of the tail vane equalled the work performed—the wheel had just its full force, and the cross strain on the wheel and vane was damaging to the whole mill, and *a large Mill had to be used to do a small amount of work.* To satisfy yourself of this fact, we respectfully refer you to the Mills in use pumping water only, but at this date most all Wind Mill Companies have a rotary ratchet motion, which is deficient, imperfect, noisy and short lived, and is no way suitable for the purposes required. *Do not class our Geared Balanced Mill with that movement.*

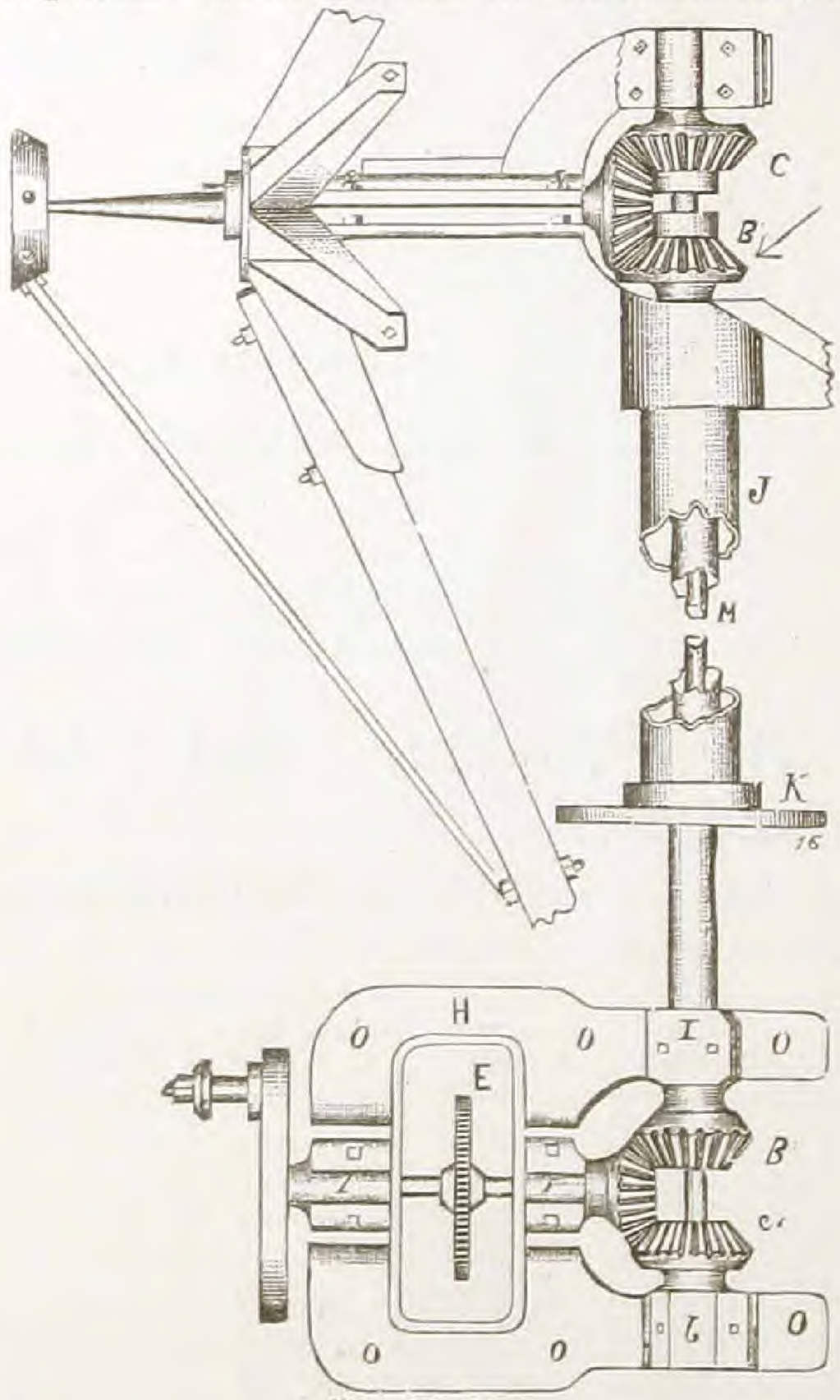


Fig. 10, W.

Fig. 10 W is a plan of our Gearing and a part of our Mill, being similar to our pumping Mill (see cut), to which we refer for a general description. B B are cog wheels attached to each end of the same hollow shaft, C C, or cog wheels attached to each end of a shaft that runs inside of shaft and cog wheels B B. Now, if the wind wheel and gear attached is rotated, then B C will revolve in opposite direction and cause the gear connecting to shaft I to revolve. E is a sprocket wheel, chain gear or pully, from which power is taken.

We can use two belts at the bottom in the place of those gearing; one of the belts would be crossed. J is our iron turning mast, K is its step or rest, and H is an iron frame which holds the gearing in place.

Now it will readily be seen that what inclination the wind wheel has to go in one direction, is balanced by its inclination to go in the other direction, and it is so simple and perfect that it requires no further explanation. With a 12-foot Mill we can pump all the water and grind all the feed for any farm of 160 acres, and warrant it; the corn bin should be large and hold at least two weeks' supply. Our 12-foot Wind Mill will grind from two to five bushels per hour, according to the wind and the fineness of the meal required. This is so perfect in its operation that we will erect it on trial, and if it does not work well, we will take it away, but it will pay for itself every year by the saving of feed. Remember that this is a perfect and durable machine, and not like the power mills heretofore used. We can erect our Mill, complete with all fixtures, pulleys and shafting, at a reasonable price. We will give prices or plans and estimates if you give us height of tower and all particulars you can think of.

Size, across the wheel, feet	12	13	14	15	16	18	20	24
Price of Double Geared Power Wind Mills	$170	$190	$220	$260	$320	$370	$400	$550
Approximate Horse Power capacity in a 20 mile wind	1.44	1.69	1.96	2.25	2.56	3.25	4.25	5.75

DOUBLE GEARED POWER WIND MILLS.

Size across the wheel, feet	12	13	14	15	16	18	20	24
Price of Double Geared Power Wind Mills	$170	$190	$220	$260	$320	$370	$400	$550
Approximate Horse Power capacity in a 20 mile wind	1.44	1 69	1.96	2.25	2.56	3.25	4	5.75

DIAMETER OF WHEELS, PRICES, WEIGHTS, Etc.

Diameter of Wheel in feet	7	8	9	10	12	13	14	15	16	18	20	24
Price of Pumping Mill	$40	$50	$60	$70	$90	$135	$180	$200	$225	$275	$325	$432
Weight of Mill	240	300	400	460	765	830	980	1100	1225	1600	1960	2840
No. Horse Power, each wheel	½	.64	.81	1	1.44	1.69	1.96	2.25	2.56	3.24	4	5.75
Price of Iron Turbine Pumping Mill	$50	$60	$70	$80	$105	$150	$200	$225	$260	$310	$365	$482
Wooden Derrick, with ornamented Platform & Brackets, painted, pr.ft.	50c	75c	75c	75c	1 00	1 00	1 25	1 25	1 50	1 75	1 75	2 00
Ornamented Iron Derrick, per foot	$1 50	$2 00	$2 00	$2 25	2 50	2 50	2 75	2 75	3 00	3 00	3 25	3 50

☞ Be sure to get Wind Mill high enough. Give number of feet from platform to bottom of well and state the amount of water required each day.

ROUND TANKS.

Size of Tank. Length of Stave.	Diameter of Bottom.	No. of Hoops.	Gallons.	Barrels.	Price at Factory at Aurora, Ill.
2 feet.	5½ feet	2	260	8	$10 00
2 "	8 "	2	750	24	15 00
5 "	7 "	4	1,295	40	25 00
8 "	6 "	6	1,541	48	35 00
12 "	8 "	8	4,234	132	58 00
10 "	9 "	7	4,356	136	58 00
14 "	9 "	9	6,190	193	80 00
8 "	10 "	6	4,161	130	65 00
12 "	12 "	8	9,463	295	135 00
12 "	14 "	8	12,900	403	160 00
12 "	16 "	8	17,000	530	185 00
14 "	16 "	10	19,900	621	215 00
16 "	16 "	10	22,800	713	250 00
12 "	18 "	9	21,000	656	220 00
14 "	18 "	10	24,800	775	255 00
16 "	18 "	12	28,000	900	300 00
14 "	20 "	10	32,000	1,000	285 00
16 "	20 "	12	36 800	1,150	335 00
16 "	22 "	12	43.000	1,340	375 00
16 "	24 "	12	51,000	1,600	420 00
18 "	24 "	13	57,600	1,800	450 00
16 "	30 "	14	80,000	2,500	600 00
18 "	30 "	15	93,000	2 950	675 00

All sizes up to and including 12x12 are made of 2 inch plank, and have drive hoops. The 12x14 and larger sizes are made of 3 inch plank, and are provided with lugs and bolts for tightening. Five per cent. discount if drive hoops are preferred on these sizes.

SQUARE TANKS.

Size of Tank. Length.	Bre'dth	Depth.	Capacity. Galls.	Bbls.	Price.
12 feet.	3 feet.	20 in's	420	13	$18 00
12 "	4 "	20 "	562	18	21 00
12 "	4½ "	20 "	630	20	23 00
14 "	4 "	20 "	660	21	24 00
16 "	4 "	20 "	757	24	28 00
16 "	4½ "	20 "	851	27	30 00
16 "	5 "	20 "	976	31	32 00
16 "	6 "	24 "	1260	40	40 00

☞ Our Square Tanks are made of two inch plank, well bolted both ways and painted.

TANK CHECK VALVES.

Fig. 6.

For ¾ and 1 inch pipe ---- $1 10
For 1¼ and 1 " " ---- 1 25
For 1½ and 1 " " ---- 1 50
For 2 and 2½ " " ---- 2 25

MISCELLANEOUS.

House Water Tanks, Faucet and Fixtures	$12 00
Hog Waterers	12 00
Sheep Waterers	12 00
Rubber Hose, per foot, ¾ inch	30
Magic Nozzle, throws Spray or Solid Stream	1 25
Churn Attachment	10 00

FLOAT VALVES AND FLOATS.

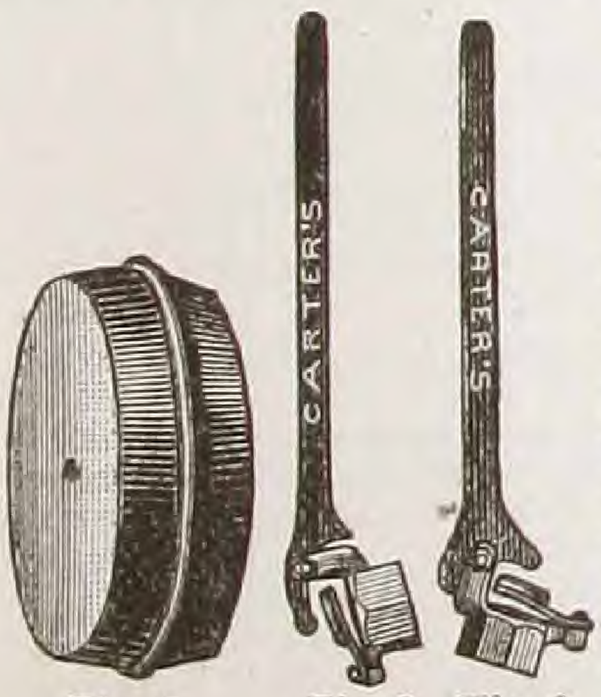


Fig. 7. Fig 8. Fig. 9.

Fig. 9 is to be screwed on to a pipe coming into the tank at the side. Fig. 8 screws on to a pipe coming in at the bottom.

This valve meets a long felt want by the trade for a simple, cheap and durable Float Valve. The body is made of brass, and the valve is easily got at to repair.

For ¾ inch pipe, Float Valve only	$1.20
For 1 " " " " "	1.25
For 1¼ " " " " "	1.50
For 1½ " " " " "	1.75
For 2 " " " " "	2.50
Copper Float	1.25

Speeded Railroad Mills.

We manufacture Railroad Pumping Wind Mills, 14 to 32 feet in diameter, and to get the greatest benefit of the wind, we gear our Mills so as to increase the stroke of the pump to its full capacity. With all Railroad Mills heretofore, a 24-foot would make 15 to 20 revolutions per minute, but with our device the number of strokes may be increased to 45, according to the conditions. A patent is applied for this device, and all wind mill makers are cautioned against using it. For railroad work it is well adapted, being mounted on a very heavy wrought iron mast, which extends down into the tower the same distance as it is required to extend above the platform, so that the wind wheel carries the weight squarely on the bearings, and travels within 1 foot of the centre. Being set on one side of the mast for its governing principle, any sudden gale will carry it to that point where the wind force on the wheel equals the work performed. When out of the wind, it stands behind the mast, and there is not the leverage on this wheel to cause it to oscillate when it should be at rest. The wheel is of the solid pattern, has straight reams on all Railroad Mills, is made of wood, as also is the vane. Nearly all its mountings are wrought iron, and what few castings there are, will harmonize in expansion and contraction; once being set up tight will always remain so. Other Wind Mills have been secured to wood work, and the expansion, contraction and shrinkage of the wood work have caused them to work loose on the derrick. The fans of this wheel being solid, cannot swing loose by accident, and there being very few places to oil, it will be readily seen that an ordinary common laborer can keep the Mill oiled, which is all that is necessary to keep it in order, while with other Mills, with their numerous joints and complications, it is required to have the skill and tools of a mechanical expert, and much labor to keep them in order. With our Mill there is no expense till it is entirely worn out.

TESTIMONIALS.

BATAVIA, ILL., February 28, 1883.

AMERICAN WELL WORKS, Aurora, Ill.—*Sirs:* The 10-foot Wind Mill put up on my place last September works perfectly in all its parts, running and raising water from one of your wells put down eight years ago, which has a depth of 82 feet. This Mill raises water when Mills of other make in the neighborhood are standing still, waiting for more wind. Persons who watch its movements all admit it is the most perfect Wind Mill made. It is almost noiseless in its movements, and governs itself like a thing of life. There cannot be too much said in its praise.

Finally and fraternally, E. S. BRADLEY.

BLACKBERRY, KANE CO., March 22, 1883.

AMERICAN WELL WORKS, Aurora, Ill.—*Gentlemen:* We have had one of the Chapman Patent Wind Mills pumping one of their wells for ten years last fall, and it has not cost to exceed $2.00. It is the oldest Mill in the neighborhood; one of our neighbors has erected *three* Mills since ours was put up. We recommend it as a good Mill.

G. R. OUTHOUSE.
JAMES OUTHOUSE.

LAFOX, ILL., February 27, 1883.

AMERICAN WELL WORKS, Aurora, Ill.: Like my Mill very much; runs smooth and steady in high winds.

Yours etc., LEVI BURINDIGE, JR.

Our Mills on the great Seedman's, HIRAM SIBLEY'S, Farms.

THE BURR OAK FARMS, SIBLEY, ILL., Aug. 4, 1883.

Gentlemen: I am pleased to say that the Wind Mills purchased of you for use of these farms and in our village give excellent satisfaction and while they work *easily* in a *light* wind they have also stood, without a particle of damage, the *furious* storms which have lately passed over this country. In one (so termed) cyclone we had last month two of our *barns* and one *dwelling house* were *blown* over and the *Mill* stood intact. In their general construction I see nothing to prevent their wearing as long as any style of Mill I have yet seen.

Yours truly, W. A. BICKET, Agent and Manager.

Iron Turbine.

COTTONWOOD SPRINGS, NEB., Jan. 1, 1884.

AMERICAN WELL WORKS, Aurora, Ill.—*Gents:* I suppose you would like to know how I like the Mill you shipped me. I have erected one or more of almost every kind that ever had a name. 1st.—It is rightly named The Advance—it is the greatest advance ever made in Wind Mills. 2nd.—It is the easiest to erect, has fewest parts and no liability of any of them getting loose. 3rd.—It is the strongest wheel I ever put up. 4th.—It runs absolutely true in circle and is perfect in balance. 5th—It has more power than any wheel of its size I ever erected. 6th.—It can start quicker and stop perfectly still sooner than any wheel made. 7th.—It runs without noise or jar. 8th.—The principle of regulating the speed by pressure of wind and side vane is perfect. 9th—It can be run faster with safety than any wheel made. 10th.—Taken altogether, it is the strongest, lightest running wheel I ever put up. I have erected hundreds for myself and others, and best of all when it is stopped, *it stands absolutely still no matter how the wind blows.*

Yours truly, O. L. ALDRICH.

COTTONWOOD SPRINGS, NEB, March 11, 1884.

Gentlemen: The Mill works to perfection. In 20-mile wind with vane as set now it makes 48 revolutions per minute. Mr. Lyle is sitting beside me and witnesses the count and operation. *Every* other Mill *solid* or *tip sail* is standing *still*, and refusing to work till the wind slacks. The Mill has run all day and never stopped once and I cannot detect any difference in motion, and I have watched it constantly for 5 hours. I never saw any Mill before that in all winds could hold its motion as regular. Yours truly, O. L. ALDRICH.

COTTONWOOD SPRINGS, NEB., April 14, 1884.

The Mill I put up for Mr. Lyle is talking loud for itself. 9 —— Wind Mills are now standing wrecks in North Platte since last storm; all of them left their towers standing. Yours truly, O. L. ALDRICH.

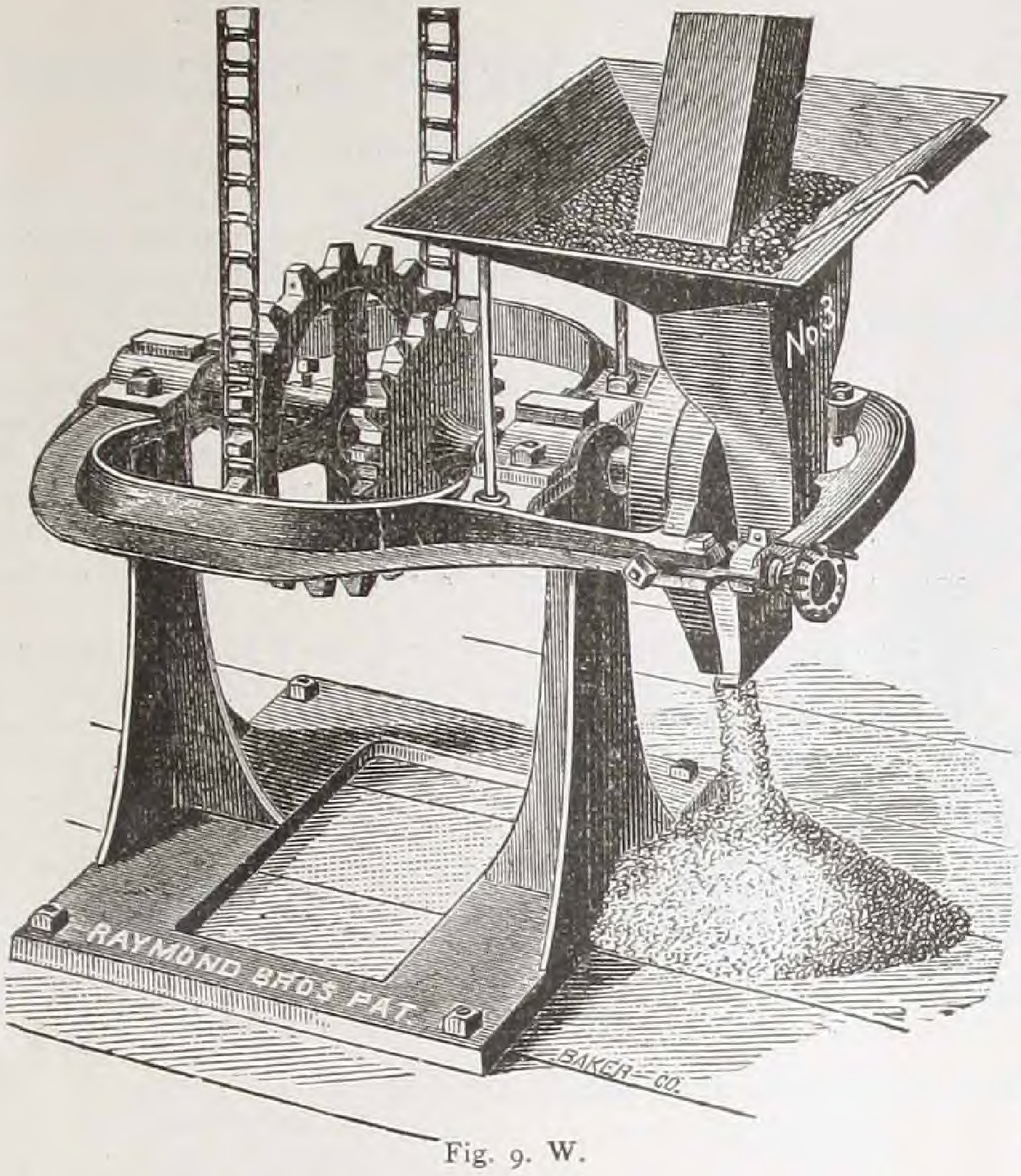


Fig. 9. W.

Fig. 9 W is our geared balanced rotary Wind Mill Grinding Mill No. 3 It should be erected on the second floor, having a large hopper holding about 100 bushels; in the next lower floor there should be a bin of the same capacity. Now let the meal run into the bin and you have a complete arrangement, always having feed ground ahead. This is the simplest arrangement.

Next we can fit up sheller, grinder and elevator, all on the same floor, with bins as in a mill or to meet your wants.

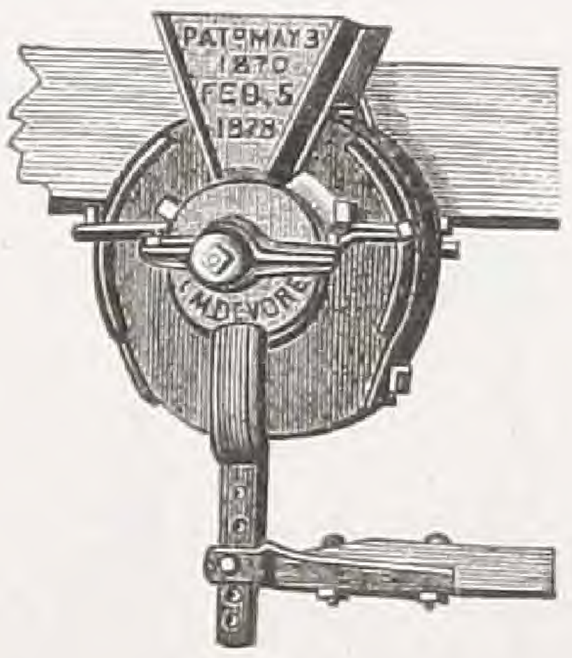
Your corn bins can be filled at leisure, when it storms or when the boys want a rest. We make these without the stand, and it is then bolted to timbers.

There should be a spout leading from the hopper to the grinder and a stop or slide to shut off the feed. We shall keep a stock of these goods on hand for this class of trade.

The capacity of these Grinding Mills is about $2\frac{1}{2}$ bushels per hour for each horse power. Very fine meal would be perhaps some less, but coarse meal would be a great deal more, and a 12-foot Mill has 1.44 horse power and four bushels of corn or oats per hour would be a fair average of its capacity—and by increasing the power you increase the capacity by increasing the motion of the grinder.

We make this size No. 3 with balance wheel pulley and belt, in place of ratchet wheel, and by using an intermediate pulley or Jack you can increase the revolutions of the feed mill and thus increase its grinding capacity. We make sizes suitable for all work, for horse or wind power, and warrant them to do as represented.

PUMPING MILL FEED GRINDER.



This is a very handy feed grinder and can be attached to a 10-ft. pumping Mill. It is bolted to a beam, and connected to the wind mill pump rod by means of suitable length of rod and elbow casting furnished with every Grinder.

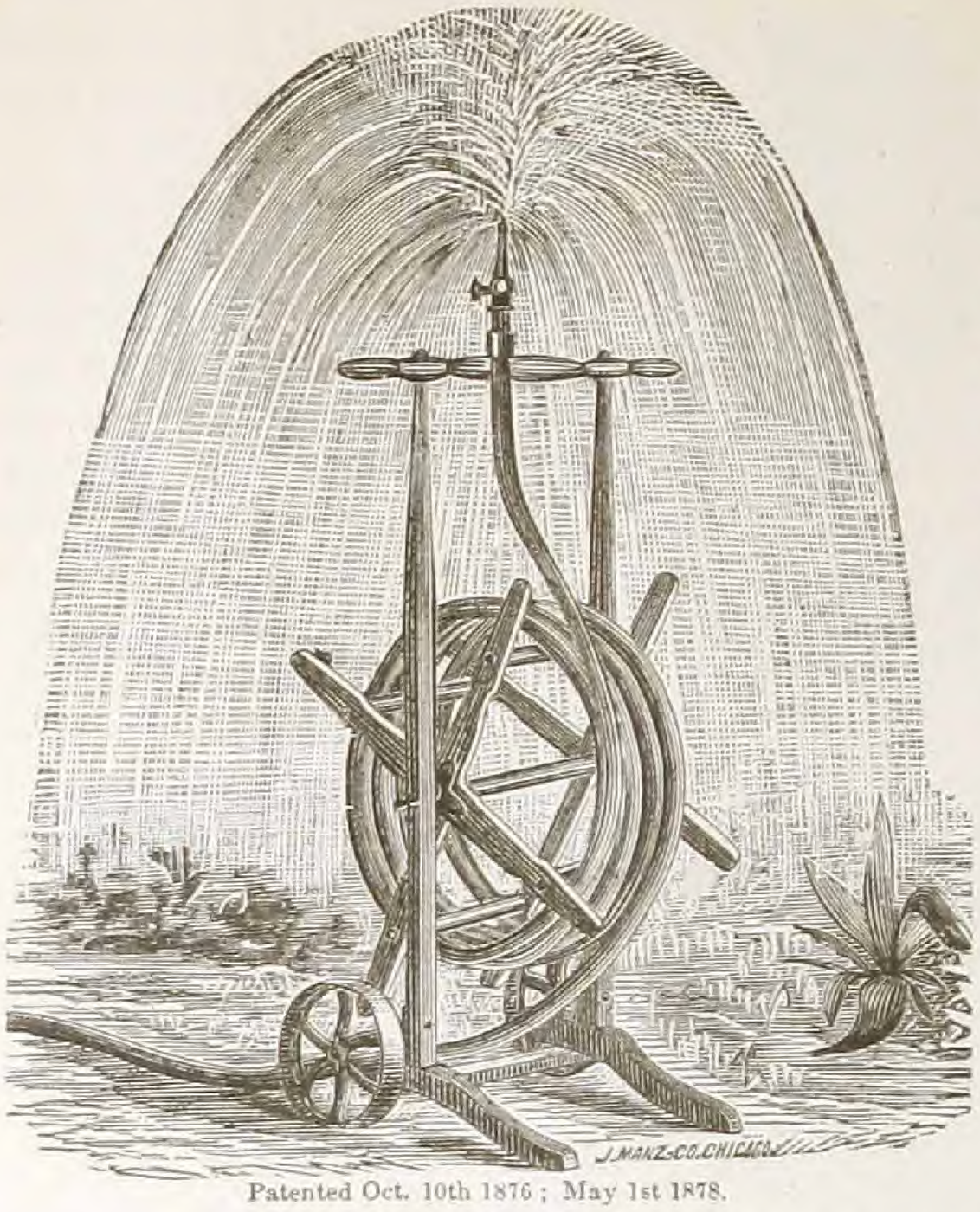
Price, complete ---------- $20.00

TESTIMONIAL.

AMERICAN WELL WORKS, Aurora, Ill.—*Gents:* With your 16-foot power Mill, erected for me this past summer, I have cut a cord of 4-foot wood twice in two in 55 minutes, and pumped at the same time. The Mill gives me perfect satisfaction.

P. L. A. STOLPH.

AURORA, ILL., November 12, 1883.



Patented Oct. 10th 1876; May 1st 1878.

NEW No. 1

FOUNTAIN HOSE CARRIAGE.

CARRIES 100 FEET 1-INCH HOSE.

An important and distinctive feature in this Carriage is the unusual diameter of the reel, which takes on the hose in coils so large that the water will pass freely through it, so that instead of taking off all the hose every time it is used, it is only necessary to let off just sufficient to reach the point desired to sprinkle; when coiled up, a few turns of the reel will effectually expel the water from the hose.

In ordinary use it is not necessary to remove the nozzle from the reel or handle the hose, either when reeling off or on, or when in operation, as the reel can be fastened by a thumb screw, so as to poise the nozzle to the required angle, but it can be readily detached and placed in the clasp at the top of the standard and used as a fountain if desired.

Price of Hose Carriage---- $3 00

PRICE LIST OF RUBBER HOSE.

Internal Diameter. PER FOOT.												
Size, inches	½	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	4
Two-Ply	.20	.25	.33	.42	.50	.58	.66	.75	.83	.92	.99	1.3
Three-Ply	.25	.30	.40	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.60
Four-Ply	.30	.37	.50	.62	.75	.87	1.00	1.12	1.25	1.37	1.50	2.00

HOSE PIPES, COUPLINGS, &c.

Size, inches	¾	1	1¼	1½	2	2½	3
Screw Tip, long pattern	$ .75	$1.15	$2 50	$3.50	$5.00	$12.50	$16.00
" " short pattern	.55	.95	1.40	2.00	----	9.60	-----
With Cock, long pattern	1.25	1.60	4.50	7.00	12.00	-----	-----
" " short pattern	.90	1.40	----	----	----	-----	-----
Nozzle to Screw	.35	.45	.70	1.25	1.85	2 40	-----
" " Wind	.35	.45	.70	----	----	-----	-----
Hose Couplings	.20	.38	.84	1.16	2.00	3.25	6 35
" " female only	.15	.25	.55	.75	1.35	2 25	4.25
Clamps, per pair	.28	.36	.48	.60	.72	.92	1.12
Sprinklers	.40	.55	1.25	1.75	2.50	-----	-----
Hose Nipples	.30	.45	.60	.85	1.20	2 00	2.75
" Caps	.30	.40	.60	.80	1.20	1.60	2.00
Spanners, malleable iron	----	----	.15	.20	.25	.30	-----

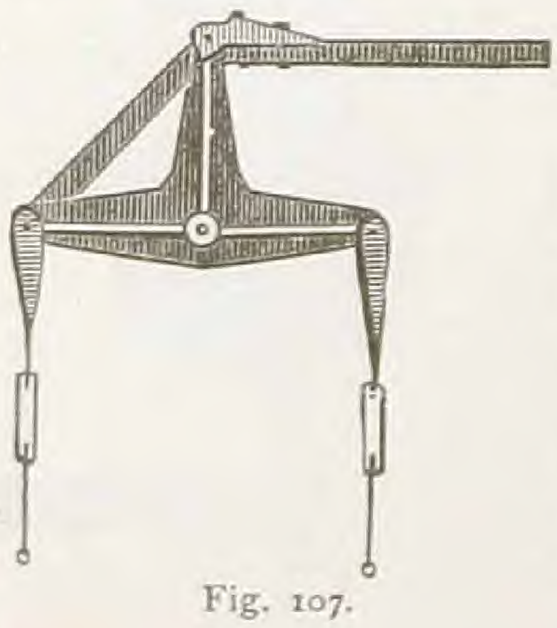


Fig. 107.

TRIANGLES.

For operating deep well pumps when the Mill has to be erected at a distance.

Light, per set (hush) ---- $5 00
Medium, " (hest) ---- 6.50
Heavy, " (run) ---- 8.00

Triangles should only be used when a direct attachment CANNOT be made to pump.

Rocking Shaft, Arms and Boxes (horse) ---- $5.00
Steel Shaft, 1¼ inch, per foot ---- .50

AIR CHAMBERS.

No. 1, [horizontal] for ¾ and 1 inch pipe [hoop] ---- $2.00
No. 2, " " 1 " 1¼ " [hot] ---- 3.00
No. 3, " " 1¼ " 1½ " [host] ---- 5.00
No. 2, [upright] " 1 " 1¼ " [hose] ---- 3.50
No. 3, " " 1¼ " 1½ " [hold] ---- 5.00

Fig. 108.

DISCOUNT LIST.

SEPTEMBER 1st, 1884.

	Catalogue Page.	Discount.
Augurs	18	50 Per Cent.
Anvils	26	Net.
Artesian Tools, (Discount on application)		
Air Chambers	64	"
Blind Valves	21	25 Per Cent.
Bracket Stuffing Box	37	10 "
Babbitt	65	Net.
Casing Puller, American	23	50 Per Cent.
Common Wedge Drill	18	25 "
Couplings, Extra Heavy	18	40 "
Combination Drill and Reamer	21	33⅓ "
Cylinder, Iron	36	50 "
Cylinder, Brass—to put in after well is made	44	40 "
Cylinder, Brass Lined	44	40 "
Challenge Earth Augurs and Tools, (Discount on application)	48	
Drill Rods	18	10 "
Drive Head	26	20 "
Drive Block	26	33⅓ "
Drive Block, Hollow	26	25 "
Die Stock and Dies	22	30 "
Expansion Jetting Drills	19	20 "
Feed Grinder, Pumping Mill	63	20 "
Force Packing	21	25 "
Forges	26	25 "
Floats	61	Net.
Float Valves	33, 61	40 Per Cent.
Foot Valves	42	20 "
Fitting Mall, Wrought and Cast	46	20 "
Guages, Water (Price in Catalogue should read $10.00 Net)	26	
Grabs	20	50 "
Grabs, Screw Pointed	20	Net.
Hydraulic Drills	18	50 Per Cent.
Horse Power	24	20 "
Horse Power, Repair List	24	20 "
Hydraulic Drilling Machine	27	Net.
Horse Power Pumping Attachment	41	20 Per Cent.
Hose Clamps	37	25 "
Hose Carriage	64	Net.
Hose, Rubber	64	30 Per Cent.
Hose Couplings, &c.	64	Net.
Jacks (to increase motion)	23	20 Per Cent.
Jack Screws	23	20 "
Jetting Machines	26	Net.
Pipe Puller	21	20 Per Cent.
Pipe Vise	21	40 "
Pipe Cutter	22	30 "
Pipe Drawing Collars	20	Net.
Pulley	23	30 Per Cent.
Pump, Fig. 15	39	35 "
Pumps, Fig. 51, 100, 101, 102, 54, 106	33	50 "
Pumps, Fig. 53, 57	33 to 39	50 "
Pumps, Fig. 59	41	25 "
Pumps, Repair Vise	38	Net.
Pumps, Repairs	38	50 Per Cent.
Rock Drilling Pump and Jars Combined	19	25 "
Rod Lifter	26	50 "
Rod Wrench	21	10 "
Reamer, American Pipe	23	33⅓ "
Rod Sockets	44	Net.
Rod Couplings	44	"
Sand Drill	20	50 Per Cent.
Steel Shoe	21	50 "
Steel Sledges	26	Net.

	Catalogue Page.	Discount.
Stuffing Boxes	37	25 Per Cent.
Screens, Chapman Patent Malleable all Galvanized	42	30 "
Screens, Chapman Self-Clearing	42	50 "
Screens, Chapman Self-Seating	42	50 "
Screens, Morrill	42	40 "
Tongs, Lifting, Holding and Sliding	21	50 "
Taps and Reamers	22	10 "
Tester and Cleaner, Chapman's Well	20	25 "
Tongs, Common Pipe	22	20 "
Tongs, Brown's	22	50 "
Tongs, Chapman's Chain	22	40 "
Tongs, Blacksmith's	26	Net.
Tanks	62	"
Triangle	64	"
Uncoupling Tongs	20	"
Valve Grab	21	50 Per Cent.
Vent Cock	34	40 "
Valves, Chapman Well	43	50 "
Valve Repairs	43	50 "
Valves, Angle, Globe, Cross	47	40 "
Well Bottoms	44	40 "
Wind Mills, Double Geared	58	30 "
Wind Mills, Pumping, up to 12 feet wheel	58	
For Cash with order		50 "
Time, 90 days		40 "
Wind Mills, Pumping over 12 feet wheel	58	30 "
Wood Rods	45	50 "
Wood Rod Couplings	45	50 "
Z Drill, American	19	10 "

SUBJECT TO CHANGE WITHOUT NOTICE.

Discount on Wrought Iron Pipe on application. This superceeds all former lists.

HOW WE SINK YOU A WELL BY THE DAY.

We will sink you a well, furnishing you one man and our well Machinery for a depth not over 300 feet for $10 per day. Time shall commence at the time our man and tools arrive at destination till they are delivered to the Transportation Company, billed to us or our order.

We will also furnish Machinery and man, as above, for sinking a 500 foot well for $12.50 per day. We will furnish Machinery and man, as above, for sinking 500 to 1,000 foot well for $15 per day. Transportation of Machinery, tools, material and man to and from our works free to us, and $3.50 and expenses per day will be charged you for his time en route.

TERMS OF SALE OF COMPLETE SETS OF HYDRAULIC OR JETTING WELL SINKING MACHINERY.

NOTICE.

We ship no sets of machinery unless one-third the price of machinery is sent with the order, or deposited in a bank payable to us or our order on presentation of bill of lading, to satisfy us that you mean business.

We will fill your order on any of the following terms:

TERMS FOR CASH.

1. When all cash comes with the order; in this case deduct 10 per cent. from list price. (See conditions at end of terms.)

2. When you send us a banker's certificate, stating you have deposited at a bank the list price of the set of machinery you order, less 5 per cent., the money to be payable to us or our order on presentation of bill of lading. (See conditions at end of terms.)

TERMS FOR CREDIT.

3. When you advance us 20 per cent. of price of machinery, and give us good, bankable security for the amount unpaid with 10 per cent. added, drawing the highest rate of interest allowed in your State or Territory, not running for a longer time than ninety days; the 10 per cent. will be deducted if paid when or before due.

4. When you send us cash to the amount of half the list price of machinery, we will take your note for the half unpaid, with 10 per cent. added, drawing the highest rate of interest allowed in your State or Territory, and secured on the machinery. The 10 per cent. will be deducted if paid when or before due, not to exceed ninety days. To get the benefit of this you must get a responsible party to guarantee you will comply with your obligations. (See conditions at end of terms.)

5. Upon very good approved security we will give time not to exceed sixty days for the whole amount of machinery, but 10 per cent. will be added to their list price, and the highest rate of interest allowed in your State or Territory charged. (See conditions at end of terms.)

TERMS FOR TRIAL.

6. To parties desiring to see tools work before purchasing, and who agree to purchase if result is as we claim in catalogue, we require that a contract be made for a well on our regular printed forms (which will be furnished on application) and forwarded to us with an advance of one-third the price of machinery, to convince us that the party means business. If satisfactory, we will send machinery ordered and a man to the place specified.

We will allow one-third the profits of this well to party ordering machine to apply on payment, if it works as described in catalogue; if not, we refund amount paid to us, pay him a fair price for his labor, and take all the profits. The profits shall be considered to be the total receipts, less the cost of the material used in the well and freight on the same

The balance remaining due to be paid when tools are shown to work as represented.

The party ordering the tools shall pay our man's railroad fare, expenses and time one way in advance, and board him while at work and assist in making the well. But it is understood that if parties ordering have not ordered a set of sufficient "depth" (that is, machinery suited to the depth of the well,) we shall exchange for suitable set of machinery, charging the difference in the price and all freights.

This is the best way for you to order, as you can then learn the business and get the experience of an expert, and you are sure of making a success. This term only applies to Hydraulic and Jetting Sets.

CONDITIONS OF EXPERTS.

To parties failing to make our machinery work through lack of knowledge, we will furnish a man from the house who will superintend and assist in the labor of making one well, to show parties, and to give all necessary instructions about the use of the machine and the science of getting water out of the various stratas.

First.—Provided that a contract be made for a well, with some good, responsible man, on our regular printed blank (which will be furnished upon application) and forwarded to us. We will assume all responsibility in this well and take the control, and allow the purchaser of the Tools one-third of the profits. The party ordering the man shall provide board, lodging and all necessary tools to make the well, and shall pay our man's railway fare, expenses and time one way *in advance*. The profits of this well shall be considered the total receipts, less the cost of material used in the well and freight on the same. These conditions apply only to Hydraulic and Jetting Sets, and in territory known by us.

N. B.—Send us a statement of the financial standing of the party who signs the well contract and thereby save delay, as we will in no case send our men till we satisfy ourselves that the party ordering the well is financially responsible It is no use sending for a man unless these conditions are complied with. The cash must accompany the order.

HOW WE WORK BY THE DAY.

Second.—We will send a man to show you how to run the tools, either Hydraulic or Jetting, to not a greater depth than 600 feet, provided the tools are paid for, at $5.00 a day and his expenses from the time he leaves till he returns (his expenses en route), to include hotel bill and first-class transportation. No deduction will be made for lost time from rainy days or any other cause except our man refuse to work ten hours in good weather, or act in any manner unbecoming a gentleman, in which case it shall be the duty and obligation of the party ordering the man to notify us immediately of such act. We will then deduct the time he may lose, and reprimand him. This is your speculation—we receive no gain nor suffer any loss. An advance to cover transportation both ways and one week's wages must be sent with the order.

COST OF MATERIALS.

Price paid for 200 feet 2 inch well	$400.00

COST OF MATERIAL.

Pump Head, Fig. 51, 5 feet	$ 4.50	
Set 2-inch Valves, Cylinder and Screen	10.50	
Ten Wood Rods and Couplings, fitted	6.00	
Black Pipe, 2-inch, 192 feet, fitted	38.40	
Freight, say	2.00	61.40
Profit		$338.60

One-third of profit equals $112.84. Thus a purchaser of Set "D" would owe us $380.00 less $112.84—or, $267.16.

When ordering machinery, state which of these terms you wish to order on.

State also what line or lines of railway you wish your goods shipped over.

CONFIDENTIAL.

PROFITS.

As shown before, the profit on a 200 foot 2-inch well is $338.60. You will get yourself, man and team boarded while making this well. Now, suppose it takes you two weeks to make this well—under favorable circumstances it will be made in less time:

You pay your man 12 days at say $1.25 ..... $15.00
Wear of machine, harness, etc., say 5.00 $20.00

$338.60 minus $20.00 leaves $318.60—your own profit for your two weeks' time. If it pays to run one machine it pays better to run two. There are lots of wells to be sunk; farmers and stock men must have water, and they will readily contract with you. They are learning every day the value of a good well of water, and are getting tired of experimenting men, with poor and imperfect machinery, who spend about half their time at the blacksmith's shop, getting repairs, alterations or additions made to their tools, and bring them back to work only to witness another failure.

WORK ACCOMPLISHED.

We are often asked the question: How many feet exactly can you drill in one day?

Like anything else, it depends upon circumstances. One of our men made a well for F. G. Brown, Campbell, Minn., 100 feet, 10 inches, in eight hours, and after deducting all expenses, cleared $105.00.

Messrs. Jewell & Rauney, for Barn's Elevator, made a well in 9 days, 216 feet, in quicksand, that would boil over surface, where parties with different processes had failed.

We made a well for Robert Burns, Roberts, Ill., 207 feet, in four days.

After seven days' drilling we sunk, the spring of 1883, a well 128 feet, at Gardner, D. T.

In 4 days, 7 hours, actual work, a well 105 ft. at Kelso, D. T., was completed this spring.

At Hamilton, D. T., our men made a well 172 feet in seven days and one hours' drilling.

At Manvel, D. T., after five days, by our Hydraulic process, water was reached at 103 feet, this spring.

These wells were made by inexperienced men, whom we had employed as helpers on one well, and then we gave them charge of a set of machinery, with only one exception.

In making your estimates add a reasonable amount of time for moving.

There is no business which needs so small a capital; is light, easy, and makes money so fast. It can take you to a new country where you can take up land, work your well machinery, grow up with the country, and become a happy and prosperous man.

The reason there is such a large profit in the well business is because we have *the machinery* so well adapted to perform the work, and the excellency of our process. Our improvements are covered by patents and applications pending.

The HYDRAULIC Jetting process, with the Paddy EXPANSION DRILL completely revolutionizes well sinking. We have perfected this process during the last season. It does away with the difficulty of driving pipe in hard pan and sticky clay. No trouble with quicksand that rises in the casing. Its work is more rapid than anything used in the past. Read pages 7, 9, 12 and 19 of Catalogue carefully.

DIFFICULTIES WITH OTHERS.

If you live in a section where well men with other machines are making failures, write to us, pointing out their trouble, and we will convince you that our process will overcome the difficulty and make successful wells.

WIND MILLS.

We have a model 10-inch Wind Mill which we supply to agents at $15, and refund the money at the rate of $1 on every mill they buy, so that when they have bought fifteen mills their model costs them nothing.

We solicit correspondence from all interested in our line of business, and shall be pleased to answer any queston and give all information we can.

CERTIFICATES.

UNION, IOWA, April 23, 1884.

AMERICAN WELL WORKS, Aurora, Ill.—*Gentlemen:* On the 10th of the month, with your "D" set of Hydraulic Well Machinery, we found water at 70 feet, where the ——— Well Company had gone 150 feet with five weeks' labor and failed. We sunk 65 feet in five hours. We feel justly proud of this, as they advertise to go two feet to our one, having used your Machinery four years without a single failure. We took down Mr. ——— iron mill that was on trial, and put up your Advance on the D. W. Hunt farm. This is the fourth mill he has tried, and is perfectly satisfied, and says The Advance takes the lead. "The American Well Works beats the World," is our motto.

Respectfully, DAVIS & HASS.

MINNEAPOLIS, MINN., May 17, 1884.

We take pleasure in recommending The American Well Works Co. to the confidence of all who may wish to do business with them. We consider them experts in the business, and perfectly responsible.

PILLSBURY & HURLBURT ELEVATOR CO.,
Per C. S. HURLBURT, Manager.

N. B—We sunk about twenty-five artesian wells for the above Company in Northern Dakota and Minnesota.

This list, terms and conditions take the place of all others, and are subject to change without notice.

PULLEYS.

BORED, POLISHED AND BALANCED, WITH SET SCREWS OR KEY SEATS.

Diam'r Inches	Face Inches. 3	4	5	6	7	8	9	10	11	12	13	14	15	16
6	$2 15	$2 35	$2 55	$2 80	$3 00	$3 25	$3 50	$3 75	$4 00	$4 25	$4 50	-----	-----	-----
7	2 25	2 50	2 75	3 00	3 25	3 50	3 75	4 00	4 25	4 50	4 75	-----	-----	-----
8	2 50	2 75	3 00	3 25	3 50	3 75	4 00	4 25	4 50	4 75	5 00	-----	-----	-----
9	2 55	2 75	3 00	3 25	3 50	3 75	4 00	4 25	4 50	5 50	5 25	-----	-----	-----
10	2 75	3 00	3 25	3 50	3 75	4 00	4 25	4 75	5 25	5 50	5 75	$6 25	-----	-----
11	2 85	3 10	3 30	3 60	3 90	4 25	4 50	5 00	5 25	5 75	6 00	6 50	-----	-----
12	3 00	3 25	3 55	4 00	4 25	4 60	5 00	5 50	5 80	6 25	6 50	7 00	-----	-----
13	3 25	3 50	3 75	4 10	4 50	5 00	5 30	5 75	6 25	6 75	7 25	7 75	-----	-----
14	3 35	3 65	4 00	4 25	4 75	5 25	5 75	6 25	6 75	7 25	7 75	8 50	-----	-----
15	3 45	3 85	4 20	4 55	5 00	5 65	6 10	6 70	7 25	7 75	8 25	8 75	-----	-----
16	3 75	4 10	4 40	4 85	5 45	6 00	6 50	7 25	7 75	8 25	8 75	9 25	$9 75	-----
17	3 90	4 30	4 75	5 20	5 75	6 35	6 85	7 80	8 00	8 50	9 00	9 75	10 50	-----
18	4 00	4 45	4 85	5 50	6 00	6 65	7 25	7 90	8 50	9 20	9 75	10 25	10 75	-----
19	4 30	5 00	5 40	6 25	6 75	7 25	7 75	8 50	9 00	9 75	10 25	10 75	11 50	-----
20	4 50	5 25	5 75	6 50	7 00	7 50	8 00	8 75	9 25	10 00	10 75	11 50	12 25	-----
21	4 75	5 50	6 00	6 85	7 50	8 25	9 00	9 75	10 50	11 25	12 00	12 75	13 75	-----
22	5 00	5 75	6 25	7 00	7 75	8 50	9 50	10 50	11 25	12 00	12 75	13 50	14 50	-----
23	5 25	5 85	6 50	7 25	8 00	9 00	9 75	10 50	11 50	12 25	13 00	13 75	14 75	-----
24	5 50	6 00	6 75	7 50	8 50	9 50	10 25	11 00	11 75	12 50	13 25	14 25	15 25	$16 25
25	6 00	6 50	7 00	7 75	8 50	9 75	11 00	11 75	12 50	13 25	14 00	15 00	16 00	17 00
26	6 50	7 00	7 50	8 25	9 00	10 00	11 50	12 50	13 25	14 25	15 00	15 75	16 50	17 50
27	7 00	7 50	8 00	9 00	10 00	11 00	12 00	13 50	14 25	15 00	15 75	16 50	17 50	18 50
28	7 50	8 00	8 50	9 50	11 50	11 50	12 50	14 25	15 25	16 25	17 00	18 00	19 00	20 00
29	8 50	9 00	9 75	11 00	11 75	12 75	13 75	14 75	15 75	16 75	17 75	19 00	20 00	21 00
30	9 00	9 50	10 50	11 50	12 50	13 50	14 50	15 50	16 50	17 50	18 75	20 00	22 00	23 50
31	----	10 00	11 00	12 00	13 00	14 00	15 00	16 00	17 00	18 00	19 50	21 00	23 00	24 50
32	----	10 50	11 25	12 25	13 25	14 50	15 50	16 50	17 50	18 50	20 25	22 00	23 50	25 00
33	----	11 00	11 75	12 75	13 75	15 00	16 25	17 50	18 50	19 50	21 50	23 25	25 50	27 00
34	----	11 25	12 00	13 00	14 25	15 50	16 75	18 00	19 20	20 50	22 50	24 25	26 50	28 50
35	----	11 75	12 50	13 50	14 75	16 00	17 25	18 50	20 00	21 50	23 50	25 00	27 50	29 50
36	----	12 00	12 75	13 75	15 00	16 25	17 50	19 00	20 50	22 00	24 00	25 75	28 00	30 25

RUBBER BELTING.

Best Cotton Duck Filling, weighing 2 lbs. per Yrd.

THREE-PLY—PER FOOT.

2 inch---17 cts.	6 inch-- 52cts.	14 inch--128cts.
2½ " ---22 "	7 " -- 60 "	15 " --138 "
3 " ---26 "	8 " -- 70 "	16 " --150 "
3½ " ---30 "	9 " -- 80 "	18 " --170 "
4 " ---34 "	10 " -- 90 "	20 " --190 "
4½ " ---39 "	11 " --100 "	22 " --212 "
5 " ---43 "	12 " --108 "	24 " --280 "
	13 " --118 "	

FOUR-PLY—PER FOOT.

2 inch---21 cts.	6 inch-- 62 cts.	14 inch--154 cts.
2½ " ---26 "	7 " -- 73 "	15 " --166 "
3 " ---31 "	8 " -- 84 "	16 " --178 "
3½ " ---37 "	9 " -- 95 "	18 " --202 "
4 " ---42 "	10 " --107 "	20 " --226 "
4½ " ---47 "	11 " --118 "	22 " --252 "
5 " ---52 "	12 " --130 "	24 " --280 "
	13 " --142 "	

Intermediate widths at proportionate prices.

Heavy 5 and 6-ply Belts to order, for purposes where great strength is required, at an advance of 25 and 50 per cent., respectively on 4-ply prices.

2-PLY MACHINE BELTING.

For Agricultural Machines, and other Light Work.

¼ in. 2-ply, per ft., 7 cts.	2½ in. 2-ply, per ft., 18c.
1¼ " " " 9 "	3 " " " 22c.
1½ " " " 11 "	3½ " " " 26c.
2 " " " 15 "	4 " " " 30c.

Endless Rubber Belts made to order with additional charge of three feet for splicing, and orders for Belts of any thickness or width can be executed within ten days from the receipt of the order.

We now keep constantly on hand a large assortment of Belts, and orders will be filled the same day they are received.

☞ Write for Discounts.

BABBIT METAL.

A No. 1, per pound ---------- 25 cents.
B No. 1, " ---------- 20 "
C No. 1, " ---------- 15 "

STANDARD LEATHER BELTING.

1 inch	$ 09	5 in--	$ 57	18 in--	$2 26	48 in---	$7 10
1¼----	12	5½---	63	19-----	2 42		
1½----	15	6-----	69	20-----	2 53	TWISTED.	
1¾----	18	7-----	81	21-----	2 74		
2 ----	21	8-----	93	22-----	2 90	1-8 in---	$ 05
2¼----	24	9-----	1 05	24-----	3 22	3-16-----	09
2½----	27	10-----	1 17	26-----	3 56	1-4 -----	12
2¾----	30	11-----	1 29	28-----	3 90	5-16-----	16
3 ----	33	12-----	1 41	30-----	4 22	3-8 -----	20
3¼----	36	13-----	1 53	32-----	4 54	1-2 -----	25
3½----	39	14-----	1 65	34-----	4 86	5-8 -----	30
3¾----	42	15-----	1 80	36-----	5 18	3-4 -----	38
4 ----	45	16-----	1 94	40-----	5 82	7-8 -----	45
4½----	51	17-----	2 10	44-----	6 46	1 -----	53

Double Belts, double price. Special discounts quoted. Price on Pure Oaked Tanned Belting on application.

SHAFTING AND COUPLINGS.

Diameter.	Weight, per foot, pounds.	Price, per foot.	Price List of Pat. Compression Couplings.	Price of Flange Couplings, per pair, fitted.
1 3-16	3 70	$ 45	$ 5 50	$ 3 50
1 7-16	5 41	55	6 00	3 75
1 11-16	7 46	70	7 00	4 25
1 15-16	9 83	86	8 00	5 00
2 3-16	12 53	1 06	9 00	6 25
2 7-16	15 56	1 30	10 50	7 50
2 11-16	18 91	1 55	12 00	8 50
2 15-16	22 59	1 85	14 00	10 00
3 3 16	26 66	2 18	16 00	11 00
3 7-16	30 94	2 56	18 00	12 50
3 11-16	35 60	3 20	22 00	14 00
3 15-16	40 59	3 75	28 00	16 00

Discounts according to market.

FLOOR STANDS—Babbitted.

Size of Shaft.	Rise, inches.	Price, each.	Size of Shaft.	Rise, inches.	Price, each.
1 3-16	6	$1 50	1 11-16	10	$3 00
1 3-16	8	2 00	1 11-16	12	4 00
1 3-16	10	2 50	1 11-16	14	5 00
1 7-16	8	2 50	1 15-16	10	4 00
1 7-16	10	3 00	1 15-16	12	5 00
1 7-16	12	4 00	1 15-16	14	6 00

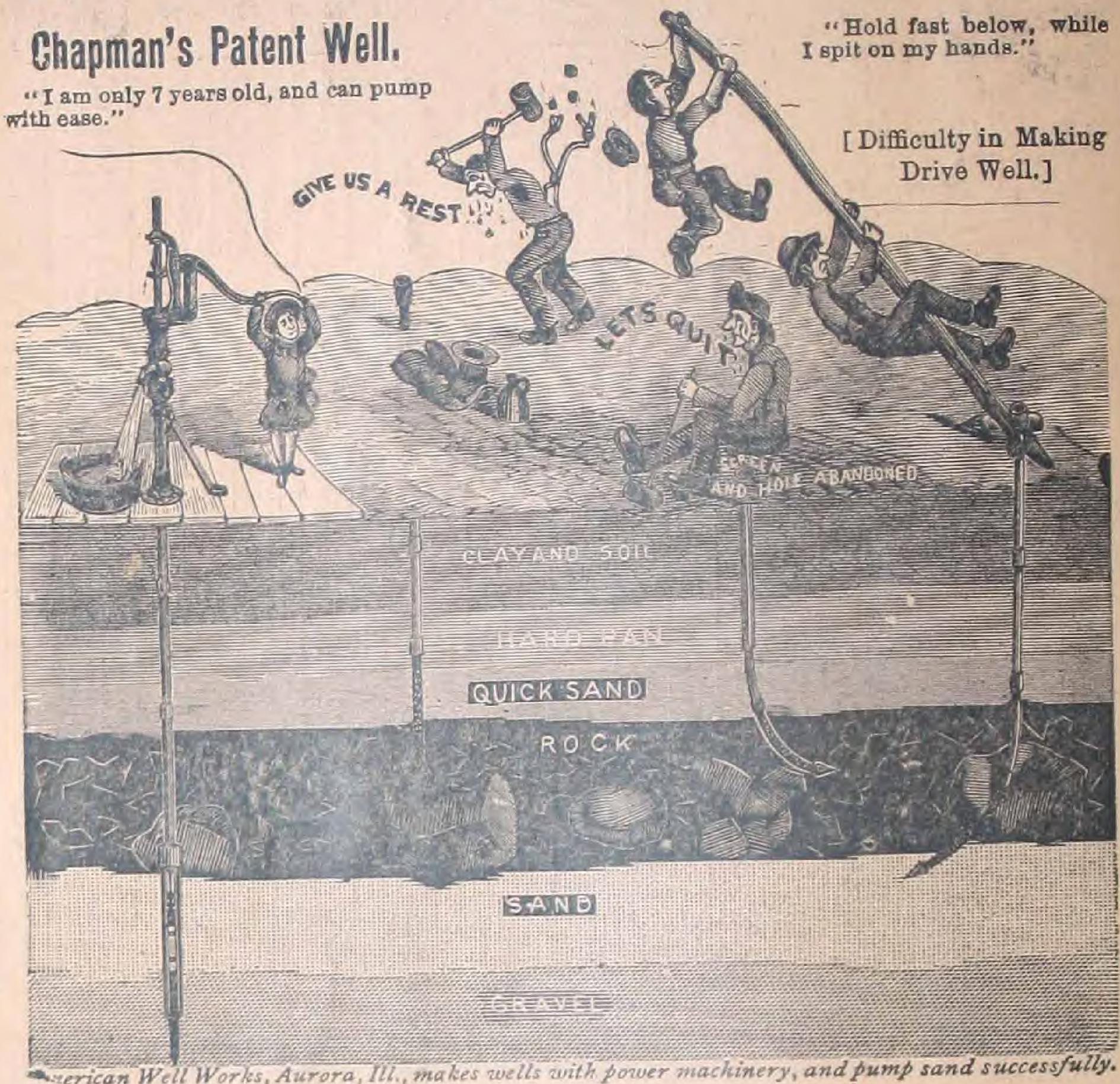
These Floor Stands may be used for Hangers.

PROGRESS IN WELL MAKING.

Chapman's Patent Well.

"I am only 7 years old, and can pump with ease."

"Hold fast below, while I spit on my hands."



[Difficulty in Making Drive Well.]

American Well Works, Aurora, Ill., makes wells with power machinery, and pump sand successfully.

American Well Works,

AURORA, ILL.